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RESULTS OF FIELD AND LABORATORY
INVESTIGATIONS CONDUCTED
FOR
REMEDIATION OF INTERIM RESPONSE ACTIONS
OTHER CONTAMINATION SOURCES
DECEMBER 1990
CONTRACT NO. DAAA15-88-D-0022/0002
VERSION 3.0
VOLUME I

Prepared by:
WOODWARD-CLYDE CONSULTANTS

Prepared for:
U.S. ARMY PROGRAM MANAGER'S OFFICE
FOR ROCKY MOUNTAIN ARSENAL CONTAMINATION CLEANUP

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1.0
SUMMARY AND OBJECTIVES

This document presents the findings of the investigations conducted to collect specific additional information to evaluate the need for and, as necessary, to support the selection of an appropriate interim response action (IRA) at four identified sites at the Rocky Mountain Arsenal (Figure 1-1). The four sites include the M-1 Settling Basins, Section 36 Complex Disposal Trenches, Lime Settling Basins, and the Motor Pool Area. Responsibility for investigating a fifth site, the dibromochloropropane (DBCP) spill site in the rail classification yard (site No. 5), was accepted by Shell Chemical Company.

This summary section discusses the following report and explains its role in the IRA alternative assessment process described in the Federal Facility Agreement (FFA). This section will also serve as a guide to direct the reader to existing and new information contained in this document.

The Final Technical Program Plan Fiscal Year (FY) 88 - FY 92 states that the objective of the Remediation of Other Contamination Sources IRA is to "mitigate the threat of releases from selected hot spot sources...." The Remediation of Other Contamination Sources IRA is described in Section 22.1 paragraph (1) of the FFA. The process set forth in paragraphs 22.5 through 22.14 of the FFA governs the assessment, design, and implementation of this IRA. The goal of this IRA assessment is defined in paragraph 22.6 of the FFA, which states that the assessment can use all appropriate previous studies or assessments to evaluate the need for an IRA and the selection of the most cost-effective alternative for attaining the objective of the IRA.

According to the Final Task Plan for this IRA, the need for an IRA should be based on whether any of the hot spots could be considered an active source of groundwater contamination, and, if so, if there is significant risk to the public, and/or if there is a clear and significant benefit to be gained by performing an IRA at this time. The IRA investigative program was designed to provide information needed to evaluate these issues and to assess the alternative remedial technologies available to perform the interim response actions.

Before the IRA assessment process, field investigative programs were conducted at each of the hot spots covered by this IRA. Review of the existing information for each site indicated that the spots may be active groundwater contamination sources, but uncertainty existed concerning possible upgradient groundwater

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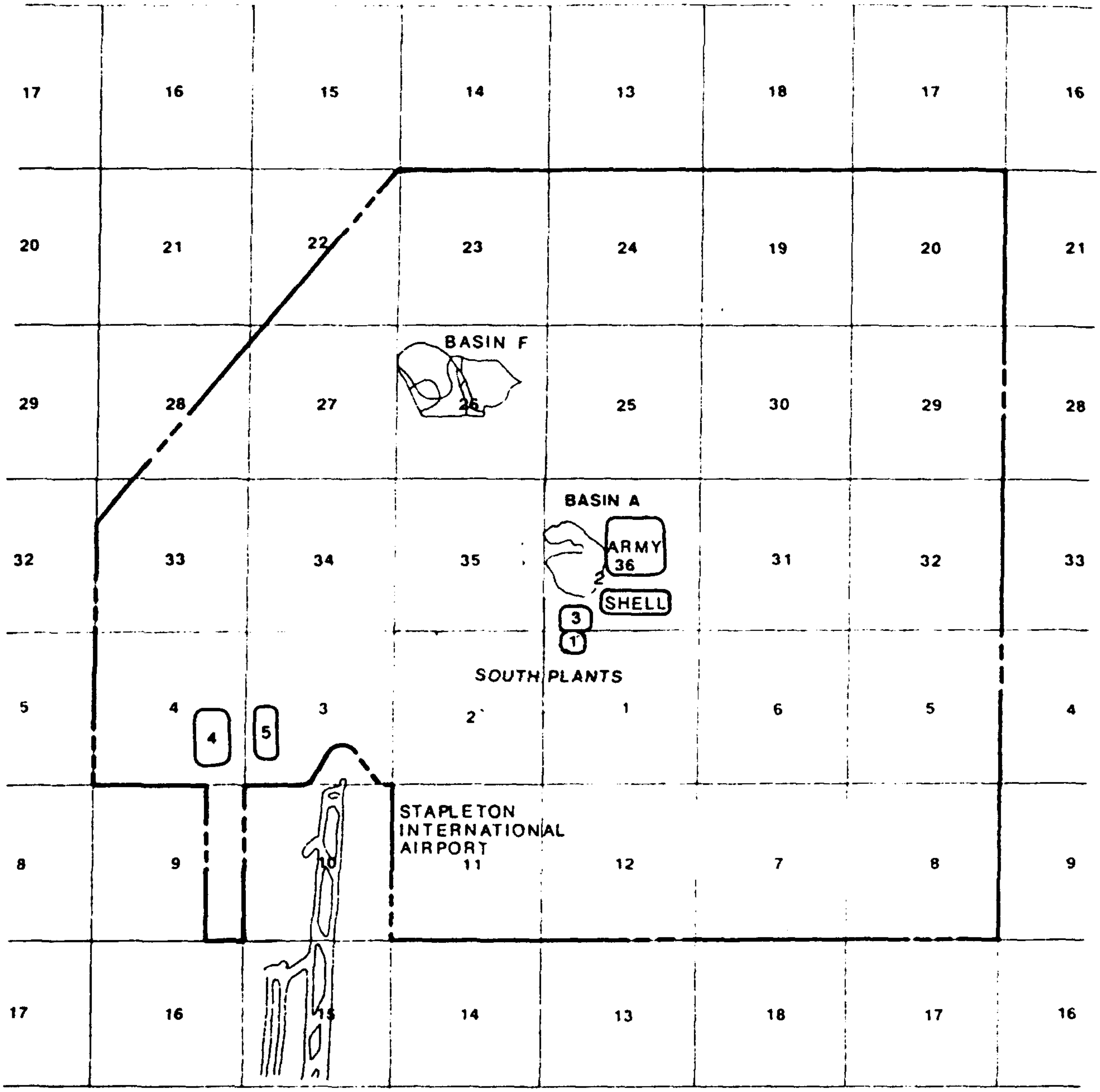

LEGEND

1. M-1 SETTLING BASINS
2. COMPLEX DISPOSAL TRENCHES
3. LIME SETTLING BASINS
4. MOTOR POOL AREA
5. RAILYARD (SHELL)

N

1" = 1 MILE

Job No. : 22238-A	HOT SPOT LOCATION MAP
Prepared by : D.C.C.	
Date : 11/16/89	Figure 1-1

contamination sources, the size or location of specific source areas, and the magnitude of groundwater contamination contributed by a hot spot relative to upgradient groundwater contamination sources.

The findings of the past studies were reviewed during the development of the investigative program implemented for this IRA. This information is presented in detail in the Central Study Area Report (CSAR), the Western Study Area Report (WSAR), the South Plants Study Area Report (SPSAR), and the North Central Study Area Report (NCSAR) and also in various Contamination Assessment Reports (CARs). These findings are summarized in Section 2.0 of this document which includes a site background overview for each of the four sites investigated under this program. The overview discusses the location, operational history, geology, hydrology, previous investigations, and the nature and extent of contamination at each site at the beginning of this program. Additional information concerning each site is contained in the study area reports.

A description of the IRA field investigative program is contained in Section 3.0. Additional detail concerning the individual investigative programs and the specific Standard Operating Procedures (SOP) for field operations are contained in the Final Task Plan and its appendixes, including the *Sample Design Plan* and Quality Assurance Program Plan (QAPP).

The results of the IRA field and laboratory investigations conducted at each area, including geophysical, soils, groundwater, soil gas survey, in situ vitrification and chemical fixation treatability evaluations, and the chemical analytical programs, are contained in Section 4.0.

Section 5.0 lists the references cited in this document.

Summarized site backgrounds, boring and trenching logs, well completion forms, well development and sampling forms, and QA/QC data are contained in the appendixes.

2.0
SITE BACKGROUND

The Rocky Mountain Arsenal (RMA), located 10 miles northeast of Denver in Adams County, Colorado, was established in the spring of 1942 as a chemical warfare agent manufacturing facility. During World War II, the Arsenal's basic mission was the manufacture of mustard, lewisite, and incendiary bombs, but arsenous chloride and chlorine gas were also produced.

During the years following the war, the Arsenal distilled all available stocks of mustard and demilitarized several million rounds of mustard-filled artillery shells.

In 1947, the Julius Hyman Company leased part of the South Plants facilities for the production of insecticides. The Shell Chemical Company (SCC) took over the operation of the insecticide manufacturing facilities in 1952 and still occupies a portion of the South Plants facilities. During the years that the facility was operated by SCC, it manufactured both chlorinated organic and organo-phosphorous insecticides and chlorinated organic herbicides.

Construction of the North Plants manufacturing facility was completed in 1953. This facility was responsible for the manufacture of GB nerve gas until 1957 and munitions filling operations until 1970.

Since 1970, RMA has primarily been engaged in the demilitarization and disposal of chemical warfare materials including GB agent, mustard agent, anti-crop agent (TX), and explosive components followed by the environmental cleanup of the Arsenal, which is now the Army's sole mission at RMA.

In the mid- to late 1970s, the Army established a contamination control program and initiated a series of contamination assessment studies. The studies led to the identification of numerous potential contaminant source areas. Several of these areas were later identified as hot spots or potential sources of groundwater contamination.

The four areas investigated under this field program were categorized as hot spots. The following sections provide information describing the location and history of each area. Additional information regarding these sites is contained in the Contamination Assessment Reports and the Study Area Reports for those areas. Detailed descriptions of the regional geology and hydrology along with site-specific geology and hydrogeology for each site investigated are contained in Appendix A.

2.1 M-1 SETTLING BASINS

2.1.1 Site Location

The M-1 Settling Basins are located in the South Plants area just south of December 7th Avenue along the northern edge of the northwest quarter of Section 1 (Figure 1-1). The northwest corner of the basins is 75 feet south of the centerline of December 7th Avenue and 30 feet east of the contaminated sewer line that drained from the South Plants into the Lime Settling Basins (Figure 2-1). The elevation of the ground surface in the M-1 Basins area is between 5,260 and 5,265 feet above mean sea level (msl). The basins and the berms surrounding them occupy an area of approximately 46,000 square feet. The elevation of the bottom of the basin, as shown in a 1943 construction drawing, is 5,256.8 feet above msl.

2.1.2 Site History

Two basins were originally constructed in 1942, but when these filled with solids, a third was constructed in 1943. All three were unlined, each measuring approximately 90 feet wide (east-west) by 115 feet long by 5 feet deep. They were initially constructed to treat waste fluids from the lewisite plant. However, lesser amounts of waste materials from the Acetylene Generation Building, the Thionyl Chloride Plant, and the Arsenic Trichloride Plant were disposed in the basins.

The liquids that were discharged into the basins had passed through a set of reactor towers where calcium or sodium hydroxide was added, then flowed north through a wood trough into the basins where the arsenic precipitated out of solution. The elutriate was decanted through a 30-inch-diameter pipe to the Lime Settling Basins (in Section 36) where final treatment took place. The treated liquids were then discharged into Basin A (Ebasco Services, Inc. 1987).

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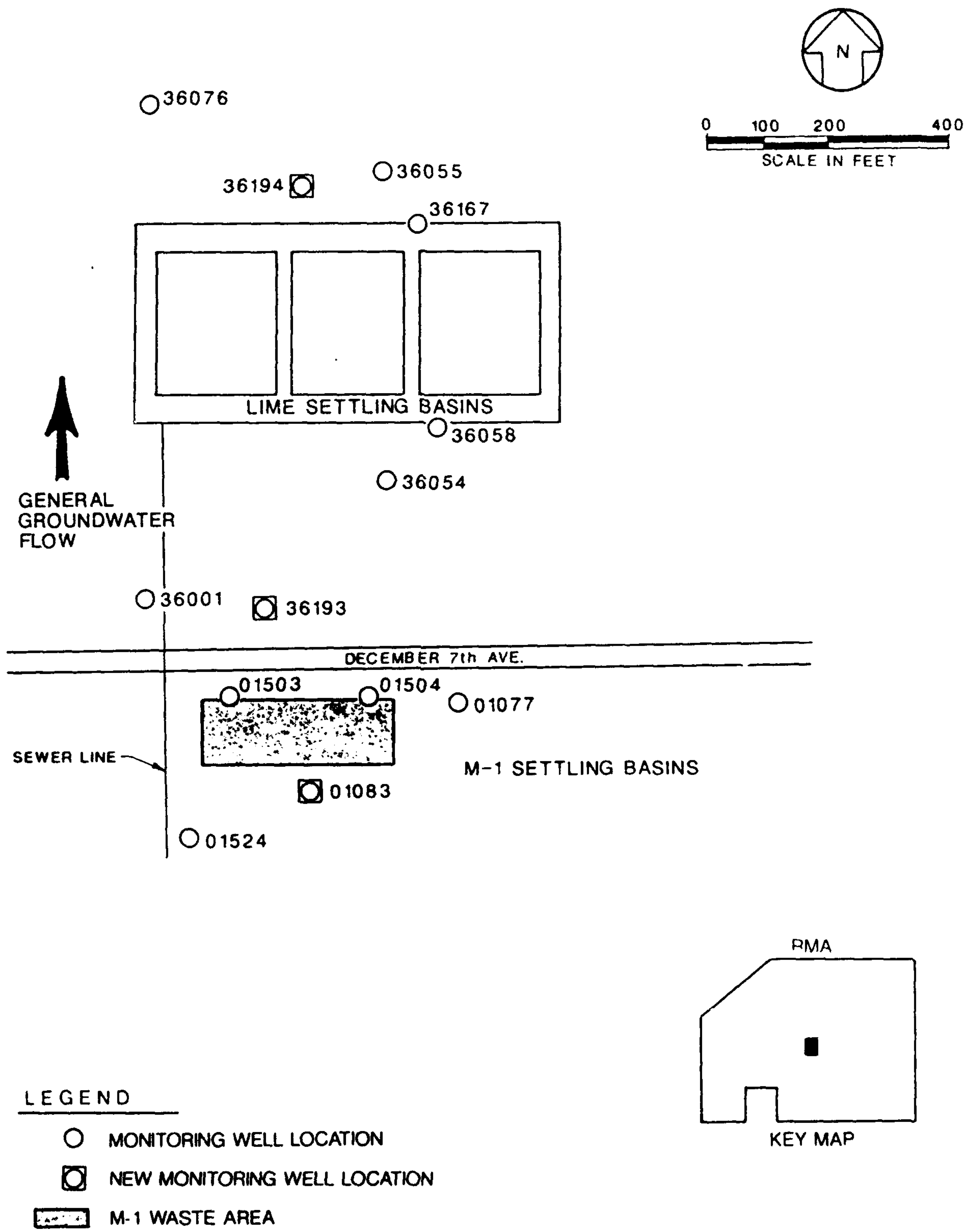


Job No. : 22238-A	M-1 SETTLING BASINS AND LIME SETTLING BASINS AREA MAP
Prepared by : D.C.C.	Figure 2-1
Date : 11/16/89	

The basins also received a considerable amount of mercuric chloride catalyst due to an accidental spill. Various sources reported quantities such as 183,000 pounds, 500 pounds, 30,000 gallons, and $25,000 worth.

The basins were backfilled in approximately 1947 and are now covered with soil and/or structures. The facilities that surround the M-1 Basins area were used by SCC to manufacture insecticides from 1952 until the 1980s.

2.1.3 Geologic and Hydrologic Setting

The Army Spill Sites investigation (Ebasco Services, Inc. 1988f) concluded that a veneer of alluvium approximately 10 feet thick overlies Denver Formation bedrock in the M-1 Basin area. However, Monitoring Wells 01503 and 01504 drilled just north of the M-1 Basins show depths to bedrock of 17 and 15 feet, respectively. Due to construction activities, artificial fill may be present over the natural alluvium. Lithologies encountered include gravelly to silty sands with lesser amounts of clayey sand to silty clay. The underlying Denver Formation is generally finer grained, more consolidated, and less permeable than the alluvial section.

Based on Figure 36-4-4 in the Phase I Lime Settling Basins report (Site 36-4) (Environmental Science and Engineering, Inc. 1987b), it appears that the groundwater gradient in the vicinity of the M-1 Basins is toward the north at 0.006 to 0.008 feet per foot. The depth to groundwater in the vicinity of the M-1 Basins is approximately 8.5 feet.

2.2 COMPLEX DISPOSAL AREA

2.2.1 Site Location

The primary area of trench disposal at RMA is in Section 36, Site 36-17. The complex disposal trench area occupies about 107 acres located in the east-central portion of Section 36 along the east edge of Basin A (Figure 1-1). Section 36 is bound by December 7th Avenue on the south, Eighth Avenue on the north, "E" Street on the east, and "D" Street on the west. The surface elevation in the study area ranges from about 5,235 to 5,260 feet above msl. Surface drainage within Site 36-17 is to the south and southwest into Basin

A. No perennial surface water exists in the study area. Figure 2-2 is a base map of Section 36 showing Site 36-17.

2.2.2 Site History

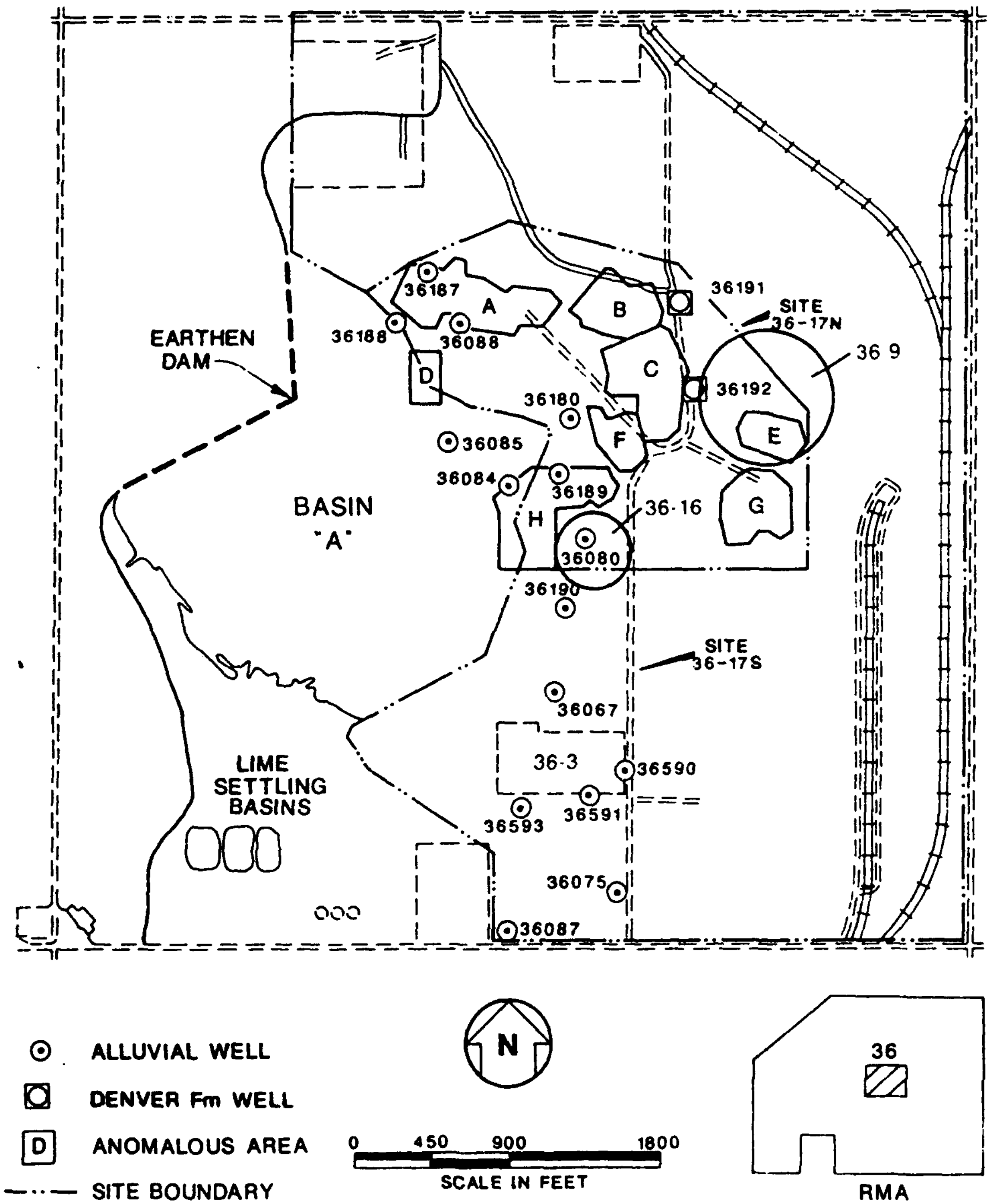
Most waste disposal activities at RMA during the 1940s and 1950s occurred in Section 36, and complex and sometimes overlapping waste disposal activities continued into the late 1960s. Most of the waste materials were disposed in burial trenches. The primary area of trench disposal activity in Section 36 is Site 36-17, which is divided into a northern (36-17N) and a southern (36-17S) portion. To facilitate the previous investigations, Site 36-17N was further subdivided into eight geophysically anomalous areas labeled A through H (Figure 2-2).

Site 36-17N, which encompasses Sites 36-9 (Incendiary Test Area) and 36-16 (Incendiary Burial Site), was the primary solid waste disposal area at RMA in the 1940s and 1950s. Solid chemical waste and potentially contaminated tools, equipment, unwanted containers, rejected incendiaries, and empty munitions casings were decontaminated with caustic or another decontaminant, and then hauled to burn trenches or pits to ensure complete decontamination by incineration.

The burn trenches or pits, approximately 8 to 10 feet deep, 15 feet wide, and 100 to 200 feet long, typically had a bottom layer of approximately 4 to 5 tons of lumber. The solid waste was placed on top of the lumber until the trench or pit was full. Additional lumber and approximately 300 to 500 gallons of fuel oil were then placed into the trench or pit and the contents burned.

Remaining metal was checked for contamination and, if necessary, reburned. The decontaminated, salvageable metal remained in the pit. Some metal was removed later and sold as scrap. The pit was then backfilled and the nonsalvagable materials buried. Burning and disposal trenches and pits appear to have been dug on a regular basis until the late 1960s (Environmental Science and Engineering, Inc. [ESE] 1988c).

Historically, trench disposal activities were originally concentrated in the center of Section 36 immediately east of Basin A. However, when the North Plants operation came online in 1952, the size of Basin A increased significantly until it eventually overran some of the older trenches. (Refer to Figure 4-1 in Section



Job No. : 22238-A	STUDY AREA MAP SECTION 36 SITE 36-17 Figure 2-2
Prepared by : D.C.C.	
Date : 11/16/89	

4.0 of this document.) The trench disposal activities gradually shifted north and then east of the expanding boundary of Basin A.

Site 36-17S is located immediately south of Site 36-17N along the east edge of Basin A. This site was primarily used to store drums of off-specification materials, including intermediates and products with potential recycling value, laboratory wastes, and filters. However, a disposal area immediately north of Site 36-3, and a nonburnable trash disposal area just north of December 7th Avenue at the western edge of 36-17S, have been reported, but their exact locations have not been confirmed.

2.2.3 Geologic and Hydrologic Setting

The surface of Site 36-17 is partly covered by a thin (0-3 foot) mantle of eolian sand/silt which overlies a Pleistocene alluvium which consists of interbedded silty sand, gravel, and clay. The alluvial thickness varies from 12 to 17 feet throughout Site 36-17N and from 18 to 24 feet throughout Site 36-17S. The soil at 36-17N is classified in the Ascalon series and is characterized as Ascalon-Vona sandy loam with a 1 to 5 percent slope. Soil at 36-17N is classified in both the Ascalon and Platner series and is characterized as Ascalon-Vona sandy loam with a 1 to 5 percent slope and Platner clay loam with a 0 to 3 percent slope (ESE 1988a).

The Denver Formation lies beneath the alluvium, and closely follows the surface topography. The Denver Formation is characterized by bentonite-rich clay/shale and compact lenticular sand horizons. Lithologic variations in the Denver Formation include interbedded siltstone, claystone, sandstone, low-grade coal, lignite, and volcaniclastic materials (ESE 1988a).

Forty-six Phase I soil borings were used to investigate the alluvium and upper portion of the Denver Formation. The alluvium consisted of sandy silt or silty sand. Eolian deposits or alluvial clay-rich zones were not recognized in any of the Phase I borings (ESE 1988a). No geological investigation was performed during the Phase II field program.

The alluvial aquifer is unconfined, and the Denver Formation aquifer is considered to be semiconfined in the upper zones and confined in the lower zones. Groundwater at RMA generally flows to the north and northwest. However, geological variations in Section 36 and the existence of a groundwater mound in the South Plants area south of Section 36 result in variable local groundwater flows in Section 36. Groundwater

depths and elevations ranged from 0.94 to 26.66 feet, and 5220.49 to 5246.11 feet above mls, respectively (D.P. Associates, Inc. 1985b). The greatest depth to groundwater in Section 36 occurs in the northwest area of the section, whereas the depth to groundwater is shallow near the center of the section.

More detailed groundwater flow information can be found in two Litigation Technical Support and Services, Task No. 4 reports by Environmental Science and Engineering, Inc. (ESE 1987c and 1988c).

2.3 LIME SETTLING BASINS

2.3.1 Site Location

The Lime Settling Basins, Site 36-4, are located in the southwestern portion of Section 36 at RMA approximately 500 feet north of the M-1 Settling Basins (Figure 1-1). The site consists of three unlined basins, each approximately 1 acre in size. The boundaries of Site 36-4, as defined by Environmental Science and Engineering, Incorporated (ESE 1987), include berms that surround the basins as well as associated materials between the basins. The total area of investigation is approximately 210,000 ft^2 and has a surface elevation of 5,250 feet above msl. Because of the proximity of the Lime Settling Basins to the M-1 Settling Basins and their related disposal history, the Lime Settling Basins are shown in the figures illustrating the M-1 Settling Basins. Figure 2-1 shows the M-1 Settling Basins/Lime Settling Basins area.

2.3.2 Site History

The Lime Settling Basins were constructed in the early 1940s to remove arsenic, by precipitation, from South Plants wastewater. Wastewater treated in the M-1 Settling Basins was piped to the Lime Settling Basins for further treatment before it was released to Basin A. The basins also received liquid waste from the South Plants until the chemical sewer was constructed in the early 1950s. Wastewater was percolated through a lime bed in the basins to raise the pH and precipitate metals (including arsenic) generated by the manufacture of lewisite.

All wastewater originating from the South Plants area was channeled through the M-1 Settling Basins to the Lime Settling Basins, and finally to Basin A. This water flowed through an underground sewer and into a ditch along the south side of the basins. Flow from the ditch into the basins was controlled. Materials

possibly contained within the basins include a reported spill of 500 gallons of mercury catalyst and the disposal of approximately 150 drums of mustard in the basins between 1959 and 1960. Reports also note that the mustard may have been neutralized, and that the term "drum" refers to a quantity and not that the material was disposed of in drum containers.

2.3.3 Site Geologic and Hydrologic Setting

The Lime Settling Basins are underlain by approximately 10 feet of Quaternary silty sands derived from alluvial fill, dune sand, and glacial outwash. Beneath the unconsolidated Quaternary alluvial and eolian deposits is the Denver Formation which forms the bedrock surface in the area. This formation consists of clay-shale and siltstone interbedded with poorly sorted, weakly lithified, fine- to medium-grained sandstone (ESE 1987b).

Phase I borings encountered alluvial material consisting of interbedded silt and silty sand to the maximum depth explored (10 feet). Much of the surface of the Lime Settling Basins is covered by fluid or dry residual material. Waste residue (nonsoil) from the Lime Settling Basins was encountered in five borings at varying depths.

The Lime Settling Basins area is in a topographic low in the southwestern portion of Section 36 (ESE 1987b). At the time of the Phase I drilling, surface water was present at the site. As of April 1987, surface water flowed from the Lime Settling Basins into Basin A as it did during the early period of use. In the later stages of active use, a drainage ditch apparently connected the Lime Settling Basins to Basin B.

The groundwater flow beneath the basins area is to the north. Within Section 36, flow direction varies from northeast to west due to local bedrock influences. Water level data gathered in March 1986 as part of the Task 4 investigation indicate the water table elevation ranges from approximately 5, 245 to 5,252 feet above msl across this site (ESE 1987c), or approximately 2 to 4 feet below the surface.

Four Phase I borings encountered water at depths between 2.2 and 3.8 feet. Using the top of boring elevations and these water levels, the estimated groundwater elevation is 5,249 feet above msl for borings 3167, 3169, 3169, and 3171, and 5,250 feet above msl for boring 3172 (ESE 1987b).

None of the Phase II borings encountered bedrock, but 14 of the borings encountered the water table at depths ranging from 4.4 to 10.2 feet.

2.4 MOTOR POOL AREA

2.4.1 Site Location

The Motor Pool Area comprises the developed area in the southeastern corner of Section 4 on the Rocky Mountain Arsenal (Figure 1-1). The site is located near the rail yard on the west side of the boundary line between Sections 3 and 4 and is approximately 650 feet by 2,300 feet in size. Structures within the site include 7 tanks, 3 old foundations, and 26 buildings. The structures consist of administration buildings, motor vehicle storage and maintenance buildings, warehouses, a railroad roundhouse and tracks, former agricultural research buildings, fuel storage tanks, a fuel station, and a groundwater well pumphouse (Figure 2-3).

2.4.2 Site History

The following overview summarizes historical events revealed from previous documents, investigations, and reports. The Western Study Area Report (WSAR Ebasco 1989) is referenced extensively throughout this section.

Before 1942, the Motor Pool site was agricultural land that was used to produce wheat and corn, or used as grassland for hay production and grazing cattle. Chemical use and storage at the site are unknown for this period.

Since being acquired by the Army in the 1940s, the Motor Pool Area has been used for servicing equipment, vehicles, and railroad cars, as well as for storing fuel, road oil, and flammable liquids. Construction of Army

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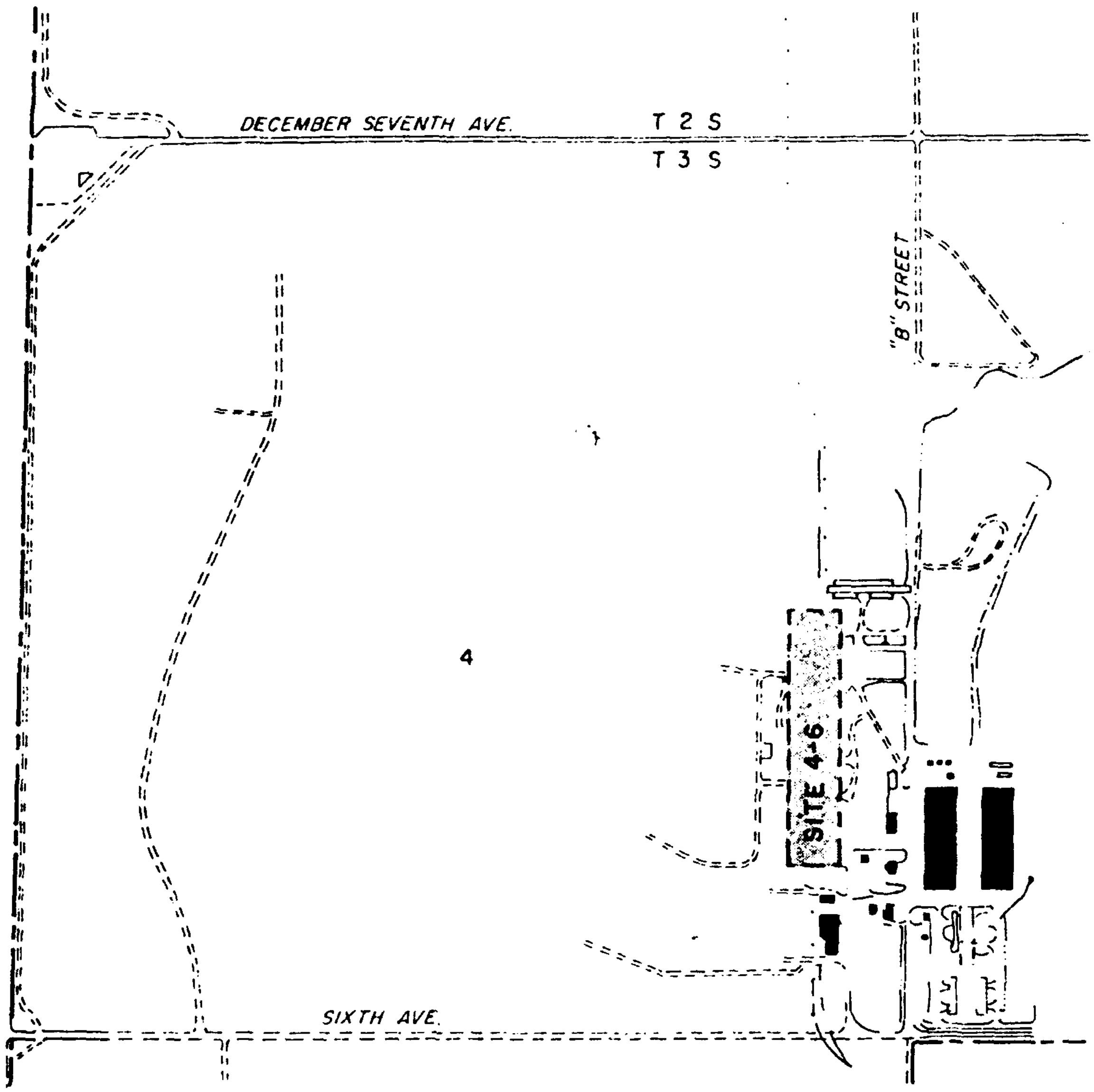
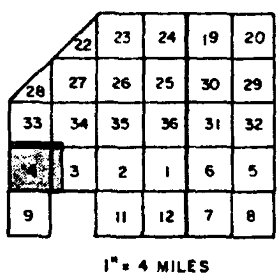
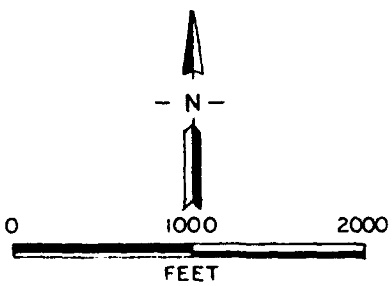


ROCKY MOUNTAIN ARSENAL LOCATION



LEGEND

4-6 SITE BOUNDARY



FROM: EBASCO 1987

Job No. : 22238	MOTOR POOL AREA
Prepared by: D.C.C.	LOCATION MAP
Date: 8/21/89	Figure 2-3

facilities at the Rocky Mountain Arsenal began in 1942. Most of the structures in the study area and the railroad spurs into the Motor Pool Area from the northwest and southern boundaries were built during initial construction activities. During this period a sanitary sewer system was constructed that extended from the Motor Pool and rail yard areas, to the north. Portions of the sewer ended in septic tanks and drainage fields. In 1945 the sewer was completed with the construction of two pump stations and a pressurized sewer line that flowed eastward into the interceptor line north of the Administration Area.

Records indicate that solvents were used for cleaning and repairing equipment and vehicles in buildings surrounding the Motor Pool from the early 1940s until at least 1985. Caustics, rust inhibitors, fuel, oil, and grease were also used, and metal surfaces of the equipment and vehicles were stripped and sanded there. Some of the buildings were known to discharge water and other liquids and residues from these maintenance operations through floor drains and pipes into unlined ditches (Ebasco 1989).

The roundhouse has been in use since the beginning of operations at RMA in 1942. It has been used for the maintenance of locomotives, railcars, and other heavy equipment. A sump, which is connected to a septic tank 100 feet to the north, was investigated in 1988. Solvents used to clean parts and surfaces may have been discharged to a ditch east of the roundhouse or possibly to the ground and septic tank (Ebasco 1988). From 1968 to 1982 the building was used by the U.S. Army reserve units for vehicle maintenance. From 1975 to 1985, it was used periodically as a repair shop for earth-moving equipment. A small structure used to store cleaning solvents and paint thinners used in Building 631 is attached to this building.

Some of the buildings in the northern part of the Motor Pool were used for pesticide and herbicide storage during the early 1950s (Ebasco 1989). At approximately the same time, several laboratories for the study of insecticides and plant pathology were operated by Julius Hyman and Company in the southern portion of the Motor Pool Area (Ebasco 1989). From 1953 to 1957, Shell Chemical Company maintained these facilities as an agricultural research and bioassay laboratory (Ebasco 1989).

Several gasoline and diesel fuel storage tanks were installed in 1942 and 1943. Each tank has a capacity of 10,000 gallons. Five of the tanks are surrounded by berms.

In 1954, three alluvial groundwater supply wells and pumphouses were constructed in the northwestern part of Section 4 to supply industrial makeup water to the South Plants during dry periods when surface water

was insufficient. The wells are still maintained for water supply to the lakes in dry years. A buried pipeline was built across the study area to carry the water.

2.4.3 Site Geology

The two uppermost stratigraphic units beneath the Motor Pool area are Quaternary alluvium and the Denver Formation bedrock. The alluvium is approximately 100 feet thick beneath the site and is comprised of sands, clayey sands, gravelly sands, and silty sands. The underlying Denver Formation is composed of interbedded claystone, sandstone, and sandy claystone (Ebasco Services, Inc., 1988a).

The alluvial groundwater flows northwest and north-northwest, which is also the regional direction of groundwater flow at RMA. The depth to groundwater below ground surface is generally about 60 feet.

3.0
IRA FIELD INVESTIGATIVE PROGRAM

This section summarizes the IRA field investigations that were conducted at the four hot spots investigated under this task order.

The IRA field investigative program was designed to collect specific information concerning the four hot spot areas. The program included extensive geophysical surveys, sampling soil and waste materials, and sampling groundwater upgradient and downgradient of the suspected contamination source areas. Samples for quality assurance and quality control (QA/QC) were collected in accordance with the Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP). One-hundred field samples were collected during the IRA investigative program from three areas: (1) the M-1 Settling Basins, (2) Site 36-17, and (3) the Lime Settling Basins. A soil gas survey was conducted at the Motor Pool Area.

3.1 GEOPHYSICS

This section describes the methods and equipment used to conduct geophysical surveys to identify possible disposal trenches and to clear locations for drilling and trenching operations.

3.1.1 Equipment Used

The EM-31 terrain conductivity meter and the EDA OMNI, including a magnetic gradiometer, were used for geophysical data collection. The EM-31 meter measures conductivity of the ground to a maximum depth of 20 feet. The EDA meter measures the magnitude of the magnetic field of the earth as well as the gradient of the magnetic field of the earth at a point.

3.1.2 Personnel Protection

Personnel who performed geophysical surveys were required to wear, at a minimum, modified Level D protection (tyvek coveralls, taped inner and outer gloves, and steel-toed rubber boots with neoprene covers). Level C protection was required in areas where there was a possible asbestos hazard or when dust levels were increased by windy conditions.

3.1.3 Geophysical Survey Procedures

Terrain conductivity and magnetic data were collected along previously surveyed grid lines. The data were collected with instruments that have internal memories, thus providing the capability to transfer the data to a personal computer (PC) for subsequent viewing, manipulation, and permanent storage. These instruments also allow the addition of locator information for each line of data so that locations can be easily recovered. The same location information was recorded in separate field notebooks as a backup.

The objective of the geophysical survey was to identify the trench boundaries, based on the assumption that disturbance of the ground and the metal in the trenches would generate both terrain conductivity and magnetic anomalies that differ from the background signal (undisturbed ground with no buried metals). Interpretation was based both on correlation of terrain conductivity and magnetic anomalies along each individual profile, as well as continuity of anomalies from profile to profile. Since several traverse profiles crossed perpendicular to the long axis of each disposal trench, continuity of anomalies from profile to profile provided reinforcement for interpretation.

The terrain conductivity meter and the magnetometer serve as metal detectors. The terrain conductivity meter measures two quantities: in-phase conductivity and out-of-phase (quadrature) conductivity. The in-phase conductivity is generally more responsive to the presence of metals. The out-of-phase data are generally more responsive to smaller amplitude changes of the intrinsic conductivities of the ground although it can also be responsive to the presence of metals.

Total field- and vertical-gradient magnetic data were collected also. The vertical-gradient data are generally more sensitive to the presence of buried metals than total-field data are, so they were relied upon more to determine whether buried metals exist (thus reflecting the presence of the disposal trench).

Previous investigations indicated that the identification of a trench is somewhat dependent upon the subjective judgement of the interpreter. Spatial correlation of anomalies from different measured quantities and correlations from profile to profile significantly increase confidence. However, it is possible that buried metals may respond to one method but not to another. Such cases require more interpretative judgement and were so noted.

Profiles stored on disk were later plotted on "hard-copy" printer output for further interpretation. Interpretation was done primarily from the profile data. Where density of data was sufficient and circumstances warranted, the data were transferred to a suitable contouring routine for generation of plan view contours.

3.2 EXPLORATORY TRENCHES

This section describes the methods and equipment used to excavate exploratory trenches to investigate Area 36-17N disposal trenches. Additional detail describing specific tasks and procedures is contained in the Final Task Plan, Sample Design Plan, and SOPs for the Task Order 2 Field Program.

3.2.1 Equipment Used

A Case W20B front-end loader and a Case 580E backhoe were used for trenching operations. A trailer-mounted high-pressure steam spray unit was used for gross field decontamination.

3.2.2 Site Setup

All trenching sites were setup in the same manner unless noted otherwise. The exclusion zone (EZ) was set at a radius of 50 feet from the actual intrusive activity for all trenching. The support crew, air trailer, and field decontamination area were kept upwind of the trenching activity.

3.2.3 Trenching

Before starting trenching activities, the ends of the original Army disposal trenches were tentatively identified, cleared, and staked based on the results of the geophysics program. See Woodward-Clyde SOP No. 5 for procedures used during the geophysics program. Except for changes listed below, trenching was performed according to Woodward-Clyde SOP No. 3 of the Sampling Design Plan.

Trenches were initially excavated to a depth of approximately 5 feet and continued at this depth laterally until waste or debris was encountered. Once the waste zone was encountered, the trench was excavated to the bottom of the waste to identify the clean soil contact at the bottom of the disposal trench. This proved

to be the most efficient method of locating the waste zones since the geophysics program identified a variety of anomalous features including waste, metal, water, and disturbed ground.

After identifying the boundaries of the waste zone, the backhoe bucket was decontaminated with a high pressure sprayer, alconox, and bleach. The waste material was sampled by scooping a bucket of material with the backhoe from the bottom of the waste immediately above the waste/clean soil boundary.

3.2.4 Sampling

The analytical samples were removed from the center of the backhoe bucket with a clean stainless steel spoon. The soil/waste was then poured from the spoon into the respective sample jars. All samples for Army agent screening were collected in the same manner except that the soil/waste was poured through a clean pyrex glass funnel and forced through the funnel opening with a clean glass stirring rod into the bottle containing chloroform. All soil/waste samples were taken in the following order:

- Soil/waste samples (and associated duplicate)
- Army lab samples (chloroform and double-bag sample)

The rinsate samples were collected by pouring distilled water over the previously decontaminated sampling utensil or backhoe bucket. The water was allowed to run directly into the rinsate bottles. All rinsates were taken in the following order:

- 1-liter amber bottles
- 250-milliliter (ml) amber bottles
- 500-ml plastic bottles (acid-fixed for total metals)
- VOA bottles

3.2.5 Decontamination Procedures

Sampling utensils and filled sample and rinsate bottles were decontaminated after sample collection by first washing them in an alconox/distilled water solution, then rinsing in distilled water. Gross decontamination

in the field was performed by first spraying with high pressure hot steam, then a bleach solution spray, and a final high pressure steam spray. Decontamination water was contained in barrels.

3.2.6 Personal Protective Equipment (PPE)

Personnel working in the exclusion zone during the trenching activity were required to wear Level B personal protective equipment (PPE). Downgrading to Level C PPE inside the exclusion zone was allowed with the approval of the site safety officer (SSO) if no instrument readings above background were encountered while trenching. All personnel outside the exclusion zone were required to wear minimum Level C PPE during intrusive activity. Downgrading to Level D PPE was allowed outside the exclusion zone when a Level C PPE downgrade was in effect inside the exclusion zone.

3.2.7 Soil/Headspace Screening Procedures

An Army M-43 instrument was placed downwind of the intrusive activity during trenching. A 5- to 6-foot length of tygon tubing was extended from the instrument toward the actual site of the intrusive activity. During intrusive/sampling activity, personnel monitored the breathing zone, open pits or trenches, waste piles, soil drums, and any exposed debris or material with ar HNu photoionization meter or organic vapor analyzer (OVA).

A grab sample of the excavated material was retrieved from the first backhoe bucket at 2-foot depth intervals in the waste or from any suspicious material from each pit or trench and placed into a plastic bag to be screened as follows:

- HNu headspace
- Army M18A2 test kit
  - (a) Nerve agents
  - (b) Lewisite
  - (c) Mustard
- Phosphoric acid esther Draeger tube

3.3 IN SITU VITRIFICATION (ISV) TREATABILITY TEST

This section and SOP No. 4 (Sampling for In Situ Vitrification [ISV] Test) may be referenced for a description of the procedures used to collect the ISV sample.

3.3.1 Equipment Used

A Case 580E backhoe was used for trenching operations to collect bulk soil and water samples. A trailer-mounted high pressure steam spray unit was used for gross field decontamination. A portable, gasoline-engine-powered cement mixer was used to composite bulk samples of both the soil and waste.

3.3.2 Decontamination Procedures

The sampling utensils and the filled sample and rinsate bottles were decontaminated by first washing them in an alconox/distilled water solution followed by rinsing in distilled water. Gross decontamination in the field was performed by first spraying with high pressure steam, then with a dilute bleach solution spray, and a final high pressure steam spray. Decontamination water was contained in barrels.

3.3.3 Bulk/Soil Sampling

Six pits were dug in the M-1 Settling Basins area for the ISV sample collection program. First, an exploratory trench was excavated perpendicular to the northern edge of the center pond to confirm the location of the waste, its boundary and profile, and to take Army lab samples for prescreening for Army chemical agents prior to bulk sample collection. Another exploratory trench was excavated approximately 10 feet from the northwestern corner of the M-1 Settling Basins in the surrounding soil for Army chemical agent prescreening.

Four sample pits were dug in and around the M-1 Basins to collect the ISV bulk samples. Four 5-gallon plastic buckets were filled with material from each of the pits. All pits were backfilled immediately after completion of sampling.

Samples for Army agent screening were collected from each pit. Approximately 50 ml of material from each of the 5-gallon buckets were placed into a large plastic bag, mixed thoroughly, and then approximately 100 ml of the mixed material was placed into both the chloroform bottle and double-bag sample.

The soil samples were composited by mixing the first and third 5-gallon buckets of soil from the surrounding soil pits in a decontaminated cement mixer for approximately 15 to 20 minutes and then placed into the first 55-gallon barrel while the second and fourth 5-gallon buckets were mixed and placed into the second 55-gallon barrel.

All four of the 5-gallon buckets of waste material were mixed in the cement mixer and placed into a 30-gallon steel drum. During mixing operations, a sheet of plastic was taped over the opening of the cement mixer and headspace air sampling was performed through this cover.

The analytical samples from the surrounding composited material were taken from the intervals specified in the Geosafe Corporation standard test plan (Geosafe Corp. 1989). A 16-inch long stainless steel sampling tube was used for obtaining the soil samples at the depths and locations specified in the plan. Each aliquot of material was placed into a decontaminated stainless steel bowl, mixed for 5 minutes with a decontaminated stainless steel spoon, and placed into the respective sample jars.

During the mixing process, the waste material liquified. Therefore, the waste material analytical samples were taken from the barrel at random locations by stirring the waste with the tube, then scooping out material with a stainless steel spoon and placing the material into the sample jars.

The rinsate samples were taken by pouring distilled water over the previously decontaminated sampling utensil, backhoe bucket, or cement mixer and allowing the water to run directly into the rinsate bottles. All rinsates were taken in the following order:

- 1-liter amber bottles
- 250-ml amber bottles
- 500-ml plastic bottles (acid-fixed for metals)
- VOA bottles

3.3.4 Site Setup

The ISV sample collection activities were setup with the exclusion zone boundary set approximately 30 feet from the actual intrusive activity. The support crew, air trailer, and field decontamination area were upwind or crosswind of the intrusive activity.

3.3.5 Personal Protective Equipment

All personnel were required to wear Level B PPE while in the exclusion zone after intrusive activities were initiated. No downgrading within the exclusion zone was permitted due to the nature of the waste. Support personnel outside the exclusion zone were required to wear minimum Level C PPE during intrusive activity. Downgrading to Level D PPE was allowed outside the exclusion zone whenever intrusive activity ceased if no HNu or arsine meter readings above background were observed.

3.3.6 Soil/Headspace Screening Procedures

An Army M-43 instrument was placed downwind of the ongoing intrusive activity. A 5- to 6-foot length of tygon tubing was extended from the instrument toward the site of the intrusive activity.

During intrusive activity, an HNu photoionization meter and an arsine detector were used to monitor the breathing zone, open pits, waste piles, and soil drums.

All samples were field screened for surety agents. The field screening was performed on grab samples of material from the first backhoe bucket out of the pit, at 2-foot intervals in the waste, and from any suspicious material from each pit. Each sample was placed into a plastic bag and screened as follows:

- HNu headspace
- Army M18A2 test kit
  - (a) Nerve agents
  - (b) Lewisite
  - (c) Mustard
- Phcsphoric acid esther Draeger tube

- Arsine Draeger tube

The bag sample, the M18A2 test kit, and draeger tubes were tested at a temperature of at least 60°F.

3.4 SOIL BORINGS, WELL CONSTRUCTION, DEVELOPMENT, AND SAMPLING

This section describes the methods and equipment used to install soil borings and new groundwater monitoring wells. Additional information is contained in Woodward-Clyde SOP No. 2 of the Sampling Design Plan.

3.4.1 Soil Borings

Ten soil borings and nine monitoring wells were installed during the field program performed for this task order. Eight soil borings and one well (No. 01083) were installed in the M-1 Settling Basins area. Six wells and two borings were installed in Area 36-17 (Nos. 36187, 36188, 36189, 36190, 36191, and 36192). Another well (No. 36193) was installed downgradient of the M-1 Settling Basins, and one was installed downgradient of Area 36-4 (No. 36194). All of the wells were installed to monitor the alluvial aquifer, except Well Nos. 36191 and 36192 in Area 36-17N. These wells were installed to monitor the upper portion of the Denver aquifer along the ridge northeast of Basin A.

3.4.1.1 Soil Sampling Procedures

All wells and borings were sampled using hollow stem augers equipped with continuous sampling tools. The sampling chamber was a 5-foot long, 3-inch outside diameter split-spoon sampler, with two 2-1/2-foot polybuterate liner inserts. To lessen the handling time and reduce the loss of the volatile organic components, the liners were precut to the required sample size whenever a chemical analysis sample was needed.

Soil samples for chemical analysis were taken from the new wells at predetermined depths. The sample interval and suite of analytes varied, depending on the location of the boring. Well Nos. 36187 through 36190 and Well No. 36193 were sampled at a depth of 0 to 1 foot and again at a depth of 4 to 5 feet. The samples were analyzed for gas chromatography/mass spectrometry (GC/MS) volatiles and semivolatiles,

organosulfur compounds, organo-chlorine pesticides, thiodiglycol, dibromochloropropane, arsenic, mercury, ICP metals, and moisture.

Well Nos. 36191 and 36192 were sampled at a depth of 4- to 5-feet and again at the contact between the alluvial material and the Denver Formation bedrock (16.3 and 8.6 feet, respectively). These samples were analyzed for the same suite of analytes listed above. Well No. 36194 was sampled at 0 to 1 feet, 4 to 5 feet, and 19 to 20 feet. The samples were analyzed for the same suite of analytes listed above with the exception of organo-chlorine pesticides and DBCP.

All sampling equipment was decontaminated before each use. Decontamination consisted of an initial cleaning with a high pressure hot water sprayer, then an alconox soap wash, followed by a rinse with the hot water sprayer for the split spoon. The polybuterate tubes were cleaned in alconox and then rinsed with the high pressure hot water sprayer. The clean tubes were then placed in the split-barrel sampler. All decontamination water was collected in a drum and transferred to a holding tank. All water used for equipment and personnel decontamination was charcoal-filtered and USATHAMA approved.

3.4.1.2 Drilling Operations

All borings were drilled using a 6-inch hollow stem auger with a 6-5/8-inch cutting head. The borings to be converted to wells were subsequently overdrilled with 10-inch hollow-stem augers with a 10-5/8-inch cutting head. This allowed the PVC well casing to be set through the center of the larger diameter augers. Each auger section was 5 feet long, and the cutting head was 0.75 foot long. Borings not converted to wells were filled with grout once the completion depth was reached.

3.4.2 General Well Construction Procedures

After the hole was overdrilled to the completion depth, the PVC casing was prepared for installation. The PVC was decontaminated in the warehouse and wrapped in plastic prior to being taken into the field. When the plastic was removed in the field, the casing was rinsed with the hot water washer. Then, the bottom plug was attached, and the centralizer was placed in the middle of the screen.

Approximately 1 foot of silica sandpack (Colorado No. 10 to No. 20) was installed as the footing for the casing. If bentonite pellets were used to seal the bottom of the hole, at least 6 inches of sandpack was installed on top of the seal. The sandpack was allowed to come up into the augers before the PVC casing was lowered through the augers. After the casing was in the hole, more sandpack was added.

A minimum of 6 to 7 feet of sand was kept in the augers at all times. The augers were pulled approximately 2 feet, and then the level of sandpack was checked. The level of sand in the augers was kept high enough to keep the screen from being exposed to the formation. This operation was repeated until the proper depth to the top of the sandpack above the top of the screen was reached.

Once the sandpack was in place, several feet of bentonite pellets were placed on top of it to form a seal. The auger was pulled up about a foot or less, and bentonite pellets were added slowly, not being allowed to enter the auger by more than 6 inches at a time. After the pellets were in place, distilled water was added to hydrate them. The bentonite pellets were allowed to hydrate for 30 minutes before sealing the remaining annulus with a cement/bentonite grout.

The grout conformed to USATHAMA standards. The formula was 1 sack of cement (94 pounds), 4.7 pounds of bentonite (which was preweighed and placed in a ziplock bag), and 5 gallons of USATHAMA-approved water. After the grout was placed in the hole, the metal protective surface casing (with a lockable cap) was placed around the PVC casing. The surface casing was kept 2 inches above the top of the PVC casing with a spacer.

3.4.3 Well Development and Sampling

This section describes the methods and equipment used to collect groundwater samples from monitoring wells. Additional information can be obtained from SOP No. 1, Groundwater Sampling.

A total of 30 monitoring wells, including both new and previously existing wells, were sampled during the field investigation for this program. Seventeen wells in Site 36-17 were sampled; 7 wells in the M-1 Settling Basins area; and 8 wells in the Lime Settling Basins area. Two of the downgradient wells sampled for the M-1 Settling Basins were resampled as upgradient wells for the Lime Settling Basins. Appendix F contains

the Well Development Summary Table, which is a detailed compilation of wells sampled, field parameters, and development history of each well.

3.4.3.1 Equipment List

The following are lists of equipment used during purging and sampling of groundwater monitoring wells.

Equipment used during purging:

- Plastic sheeting for ground cover
- Honda suction pump
- 1-inch (O.D.) flex hose
- Well servicing rig with 10-foot steel bailer
- PVC bailer
- Water level probe
- HNu
- Arsine meter
- Draeger tube capable of detecting arsine
- Specific conductivity meter
- 55-gallon drums

Equipment used during well sampling:

- Stainless steel bailer
- Sample bottles
- Coolers with blue ice
- Nylon rope

Equipment used during sample filtration:

- Nalgene disposable filterware with 0.45 micron filter
- Nalgene hand pump

- Silicone hose

Equipment used during decontamination:

- Alconox soap
- Distilled water
- Spray bottles

3.4.3.2 Personnel Protection

Personnel performing groundwater sampling were required to wear, at a minimum, Level C protection, which included: tyvek coveralls, saranex-coated coveralls, inner and outer gloves, rubber boots with steel toe and shank, disposable boot covers, and full-face respirator with organic vapor/hepa cartridges and with all joints taped and sealed. A hard hat was also required when working around the Smeal rig. If arsine was detected or HNu readings were above background in the breathing zone, Level B protection was required, which included the above, plus pressure-demand self-contained breathing apparatus (SCBA) or an air-line breathing system.

3.4.3.3 Sampling Procedures

All sampling equipment was decontaminated prior to purging or sampling according to procedures outlined in Section 7.0, SOP No. 1, Groundwater Sampling. New, clean plastic sheeting was placed around the well, and drums for evacuated water were placed next to the well. Before a sample was taken, the well was purged with either a suction pump or bailer. Approximately five casing volumes of water were removed. The well casing volume was calculated by the following formula:

For 4-inch diameter casing:

$$[(H) \times 0.653 + (H) \times 0.591] \times 5$$

For 2-inch diameter casing:

$$[(H) \times 0.163 + (H) \times 0.726] \times 5$$

where H = total depth - water level

Field samples were collected during purging to measure pH and conductivity in order to ensure that the water chemistry was stabilized before sampling. If necessary, additional volumes were removed to obtain stability. If the well went dry during purging, it was allowed to recover and then purged at least one more time before sampling.

After purging, wells were sampled with a stainless steel bailer that was lowered into the hole with a dedicated nylon rope. Sample bottles were filled according to SOP No. 1, Groundwater Sampling. Wells in the M-1 Settling Basins area and Lime Settling Basins area were sampled for both filtered and non-filtered arsenic and mercury. Filtered samples were passed through a 0.45 micron nalgene filter prior to acidification.

After sample bottles were filled, sample times and the sampler's name were recorded on the labels and covered with clear tape. The bottles were decontaminated using an alconox wash and a distilled water rinse. The bottles were then put in double ziplock bags and bubble pack and stored in coolers with blue ice. They were then transferred from the field crew to the sample management team.

3.5 ANALYTICAL PROGRAM

This section describes the specific analytical program developed for each of the four hot spot areas investigated under this task.

The investigative program included collecting samples of soil, water, and waste for chemical analysis to evaluate contaminant concentration. Additional data were collected to further evaluate the hot spots to provide adequate information to perform interim response action (IRA) alternative assessments.

The analytical measurement program was designed to take advantage of past chemical analyses and provide additional specific information to assess the need for an IRA. To accomplish this, a suite of analytes detected during previous investigations was developed for each study area. The analytical program used USATHAMA analytical protocols.

A sufficient volume of sample was gathered for each analyte to obtain the maximum sensitivity that the method and matrix would allow. Sample handling for each analyte was performed in accordance with the method requirement to meet the internal quality objectives specified in the Quality Assurance Program Plan (QAPP) for precision and accuracy.

The analytical program was designed to evaluate information from the following sources:

- Certified USATHAMA laboratories audited by Rocky Mountain Arsenal (RMA) program management officers

- RMA Army laboratories performing active agent screening and testing

- Non-USATHAMA testing facilities including treatability evaluations and in-field soil gas studies

- Field observations by personnel performing sampling and/or other activities at the study areas

Each of the information sources is described briefly in the following paragraphs.

3.5.1 USATHAMA Laboratory

The laboratories performing the bulk of the USATHAMA method testing were chosen for specific experience with the RMA sample matrices. The laboratories are audited quarterly by the RMA program manager's staff for adherence to certified methods for soil and water. Unique analytes sometimes required the use of a specific laboratory that is certified for a particular method. Analytical data were provided in a format that can be directly transferred into the Rocky Mountain Arsenal Data Management System (RMADMS) computers after validation by project chemists and RMA personnel.

3.5.1.1 Surety Screen

The on-site U.S. Army laboratory provided surety agent screening and analyses for all samples sent off site. Water samples were field-tested using test kits provided by the Army. All soil and waste samples were sent directly to the on-site RMA laboratory for evaluation for agents.

3.5.1.2 ISV Treatability Test

A bench scale treatability test of in situ vitrification of representative soil and waste samples from the M-1 Basins area was conducted. Before conducting the bench scale test, the soil and waste samples were analyzed using EPA leaching methods and both EPA and USATHAMA method evaluations of the leachate. In addition, some National Institute of Occupational Safety and Health (NIOSH) methods were examined for applicability to sample offgasses generated during the bench scale studies and for personal air monitoring for field personnel.

3.5.1.3 Chemical Fixation Treatability Test

One of the remedial technologies under evaluation in the IRA alternative assessments for both the M-1 Settling Basins and the Lime Settling Basins is chemical fixation of the contaminants in the soils and sludges. A treatability test was deemed necessary to evaluate the effectiveness of this technology on arsenic, mercury, organochlorine pesticides, and organosulfur compounds.

Samples of the sludge from the M-1 Settling Basins and the soil at the Lime Settling Basins were collected for the treatability test. The M-1 Settling Basin sample was taken from a drum of unused sludge remaining from the ISV bench-scale treatability test. A Lime Settling Basin soil sample was taken from three areas at the site. The three locations were chosen based on data obtained by Environmental Science and Engineering, Inc. (ESE) during their Phase II investigation: one is near ESE's Phase II Boring No. 3422 at the 0- to 1-foot interval, another is near ESE's Phase II Boring No. 3417 at the 2- to 3-foot interval, and the third was taken near ESE's Boring No. 3204 at the 0- to 1-foot interval. Only the soil collected near Boring No. 3204 could be used for the treatability test because the other two samples tested positive for lewisite at the RMA laboratory.

Three one-gallon samples were taken from both the M-1 Settling Basins and the Lime Settling Basins for the treatability test. In addition, a sample from each site was sent to DataChem, Inc. These samples underwent a toxicity characteristic leaching procedure (TCLP) extraction and analysis. The M-1 Settling Basin sludge sample was analyzed for arsenic and mercury. The Lime Settling Basin sample was analyzed for arsenic, mercury, organochlorine pesticides, and organosulfur compounds. The same analyses were then performed on the chemically fixed materials. This provided an indication of the treatment effectiveness.

3.5.1.4 Field Observations

Field crews were directly involved with the sampling effort as well as making and recording field observations that help to evaluate the fate and potential transport mechanisms of the contaminants.

The following sections describe the analytical program developed for each of the study areas.

3.5.2 M-1 Basins

Previous investigations at the M-1 Basins indicated that the waste material contained in the ponds was contaminated by high concentrations of arsenic and mercury, and the surrounding areas have been contaminated by pesticides and manufacturing intermediates from various areas.

Analyses for wastes in the ponds and borings surrounding the ponds at the approximately 4- to 5-foot level of the waste included GC/MS volatiles, GC/MS semivolatiles, DIMP/DMMP, inductively coupled plasma (ICP) metals, mercury, arsenic, organochlorine pesticides, organosulfur-containing compounds, and thiodiglycol. These analyses were also used to characterize drill cuttings for disposal.

Samples taken from below the ponds and at various levels in the surrounding soils evaluated both potential movement of contamination from the ponds and also movement of other contaminants from other areas. These samples were tested for a more limited list of analytes including mercury, arsenic, and GC/MS semivolatiles.

Analysis of water samples collected from five existing wells and two new wells included filtered and non-filtered arsenic and mercury to evaluate migration of contamination from the ponds. Water level, pH, and conductivity readings were also taken. In this phase of the work, a total of 27 soil samples, including 1 Denver Formation sample, 3 waste samples from the 4- to 5-foot level in the ponds, and 7 groundwater samples were collected and analyzed.

Waste materials shipped offsite for the chemical fixation and ISV treatability testing were analyzed by both USATHAMA and EPA methods for analytes, including GC/MS volatiles and semivolatiles, organochlorine pesticides, organosulfur-containing compounds, thiodiglycol, DIMP/DMMP, mercury, arsenic, ICP metals,

polychlorinated biphenols (PCB) (EPA protocol), dioxin screen, and moisture. Composited samples of soils surrounding the M-1 Settling Basins were similarly evaluated, except for the dioxin screen. Additionally, some waste samples were selected for testing their natural density and specific gravity. After the ISV melt, the glassified material was evaluated by EPA-TCLP methods for arsenic, mercury, aldrin, and dieldrin.

3.5.3 Complex Disposal Trenches

The investigations at the Complex Disposal Trenches focused on the physical delineation of several disposal trenches with a high risk of groundwater contamination and evaluation of the potential for migration of contaminants from those trenches. The waste samples collected at the bottom of each of the exploratory trenches, as well as two soil samples from borings advanced below two of the trenches, were analyzed for ICP metals, arsenic, mercury, organochlorine pesticides, organosulfur-containing compounds, GC/MS volatiles and semivolatiles, DBCP, DIMP/DMMP, thiodiglycol, fluoroacetic acid, and IMPA/MPA.

Eleven existing monitoring wells were sampled to collect information concerning the quality of groundwater entering and leaving the trench disposal area. The existing wells were analyzed for the same analytes as above. In addition, six new wells were installed at key downgradient locations. Soil samples were collected during installation of the new wells, and water samples collected later were analyzed for the same analytes as above. Two of the new wells were completed in the Denver Formation. Water samples from these wells were analyzed for the same suite of analytes.

During activities in Section 36, personal air monitoring was conducted by members of the Health & Safety staff. This sampling focused primarily on some piles reportedly containing friable asbestos and on several organic compounds historically found in the area.

During this field program, the site 36-17 trench area was sampled as follows: 21 groundwater samples, including 2 from the Denver Formation; 14 soil samples, including 2 from the Denver Formation; and 14 waste samples collected from the trenches.

3.5.4 Lime Settling Basins

The Lime Settling Basins, located in the southwestern portion of Section 36 and hydrologically downgradient of the M-1 Basins, treated wastewater from a variety of operations in the South Plants area. The available historical analytical data suggested that these basins contain elevated levels of arsenic and pesticides. The sample regimen developed for this area was designed to evaluate upgradient and downgradient groundwater samples to ascertain if contaminants from these basins are entering groundwater.

The program included sampling water from established wells and water and soil samples from a new downgradient well. All samples were analyzed for GC/MS volatiles and semivolatiles, organochlorine pesticides, organosulfur-containing compounds, thiodiglycol, DIMP/DMMP, and ICP metals. Because this area is located downgradient of the M-1 Basins, water samples were evaluated for filtered and nonfiltered arsenic and mercury. Water levels, pH, and conductivity were measured in each well sampled. Nine water samples (including one duplicate) and three soil samples were taken from the Lime Settling Basins during this field program.

3.5.5 Motor Pool Area

Previous investigations have indicated that the Motor Pool Area may be a possible source of trichloroethylene (TCE) groundwater contamination. The objective of this program was to further delineate a plume of TCE in soil gas indicated by previous soil gas analysis. The investigative program included a soil gas study to specifically map the southern edge of the indicated TCE plume and to attempt to identify its source. To evaluate the optimal sample depth at the start of the survey, soil gas samples were taken on a smaller grid pattern and from multiple depths. A modified EPA method 502.2, which gives concentrations for up to 42 chlorinated and nonchlorinated components, was used to analyze samples collected on charcoal adsorption tubes. A total of more than 100 sample points were originally planned, but not all of these were used to delineate the area of the TCE plume. During the field program, 80 soil gas samples were collected at 65 sample points. In addition, four soil samples were collected for analysis using the purge and trap method described in Section 3.10.4.

3.6 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

The QA/QC program for the field investigation consisted of two major components: (1) the QA/QC samples taken to evaluate the precision and accuracy of sample collection procedures and laboratory analysis, and (2) the field audits performed during the sample collection.

3.6.1 QA/QC Samples

QA/QC samples included duplicate samples, decontamination rinsates, filtered rinsates, field blanks, and trip blanks. This section summarizes the sample collection procedures and the frequency with which they were taken. Additional details can be found in the QAPP, which is Appendix D of the Task Plan, and the SOPs for this field investigation, which are contained in the Sampling Design Plan in Appendix C of the Task Plan.

3.6.1.1 Duplicate Samples

Duplicate samples were collected at a rate of 1 duplicate per 10 samples per matrix per sampling area. The purpose of these samples was to assess the precision of the sampling procedures and laboratory analysis, as well as the natural variability of the analyte concentrations and matrix characteristics.

Groundwater duplicates were taken by filling similar bottles for both the sample and the duplicate in the order specified in the SOP for Groundwater Sampling. For example, all of the VOA bottles for both the sample and the duplicate were filled, and then all of the semivolatile bottles for both the sample and the duplicate were filled and so on until a full sample and duplicate were collected.

Duplicates for the trench samples were taken by filling the sample jars with waste material in the same manner as described previously for the groundwater duplicates. Soil boring duplicates were taken immediately below the field samples in the soil boring.

3.6.1.2 Rinsate Samples

Rinsate samples were collected at a rate of 1 per 10 samples per sampling area. They determine the effectiveness of the decontamination procedures. Locations for collecting rinsate samples were chosen randomly.

Rinsates for groundwater were taken by running distilled water through the sampling equipment before sampling. One rinsate was taken through the tubing of the peristaltic pump before the one sample that was taken by using the peristaltic pump. The remainder of the rinsates for groundwater sampling were taken over the stainless steel bailer used to collect the samples prior to sample collection. In addition, two rinsates were taken from the 10-foot steel bailer used to purge the wells prior to sampling.

Half of the rinsates for trench sampling were taken by running distilled water over the decontaminated backhoe bucket before the sample was taken. The other half of the trench sample rinsates were taken by running distilled water over the decontaminated sampling spoon before the sample was taken.

The rinsates taken for soil borings were taken by running distilled water through the dedicated polybuterate tubing, which was assembled in the core barrel. One of the soil boring rinsates actually consisted of two rinsates: one by pouring distilled water through the polybuterate tube, and one by pouring water through the core barrel.

3.6.1.3 Filtered Rinsates

Three filtered rinsates were taken before samples that required filtering for analysis. The rinsates were taken by pouring the distilled water through the filter apparatus that was used to filter the sample in the field and were considered part of the total rinsate taken before the associated sample.

3.6.1.4 Field Blanks

Field blanks were collected at a rate of 1 per 20 samples for the water samples. They are used to isolate any contamination due to the sampling event itself and were collected by pouring distilled water into the sample bottles at the sampling site immediately following the sampling event.

3.6.1.5 Trip Blanks

A trip blank was sent in every sample cooler that was shipped. Trip blanks remained unopened and were analyzed for volatiles at a rate of one per shipment.

3.6.2 QA/QC Field Audits

Audits were conducted during the field program in conformance with the QAPP. The field audits consisted of reviewing the field activities and managing activities to ensure that the procedures set forth in the Task Plan, Sampling Plan, and QAPP were followed. Additional audits were performed whenever there were changes in field personnel or specific situations requiring corrective action.

Field audits were conducted as system audits on the following activities: trenching, drilling, well construction, groundwater sampling, geophysics, decontamination of personnel and equipment, soil gas survey, waste management, sample management, and equipment management.

In addition, audits of field records, field activities recording, and sample tracking systems were conducted.

The summary reports discuss the scope of the audit, observations and findings, recommendations, and recorded field nonconformances, variations, and field changes. A nonconformance as defined in the QAPP Section 10 is a deficiency which, if left uncorrected, could render the quality of an item unacceptable or indeterminate. Reports documented any deficiencies along with the corrective action implemented to bring the item into conformance. Nonconformance reports (NCRs) were written and acted upon by responses and corrective actions, approval, and confirmation.

NCRs included:

- No. 1 - April 28, 1989 - NCR No. 1 involved an incorrect sample number on a chain-of-custody form dated April 19, 1989. The correct number was verbally relayed to the laboratory and a copy of the corrected chain-of-custody form was mailed to the laboratory.

- No. 2 - April 28, 1989 - NCR No. 2 involved an incorrect sample number on a chain-of-custody form dated April 25, 1989. The correct number was verbally relayed to the laboratory and a copy of the corrected chain-of-custody form was mailed to the laboratory.

- No. 3 - May 24, 1989 - NCR No. 3 covered an incident that occurred while purging Well No. 01083. While priming the pump with deionized water, a small volume, judged to be less than one half gallon, was observed flowing through the pump and spilling down the purge hose into the well.

  USATHAMA procedures specify that if water is added to a boring or well for any reason, then 10 times the volume of water added must be removed before the well can be sampled. The volume of water that spilled into Well No. 01083 was less than one half gallon. The additional volume removed was 45 gallons, which represents more than 10 times the volume introduced into the well.

3.6.3 Data Validation and Reporting

The purpose of data validation is to ensure adherence to the PMRMA/Chemical Quality Assurance Plan, Version 1.0, July 1989. All field and laboratory data resulting from the Rocky Mountain Arsenal Feasibility Studies were reviewed to assure that data submitted were of satisfactory quality to use for data interpretation as well as acceptable for the Installation Restoration Data Management System (IRDMS) data base.

Chemical data were received from the laboratory in both hard copy and electronic format. The hard copy was reviewed by calculating all surrogate spike recovery and examination of results. IRDMS codes were reviewed to ensure that all required information was correctly entered by the laboratory.

Next, the chemical data were electronically uploaded into a PC version of IRDMS Record Check program. A record check determined whether the analysis was performed within holding times and if data were reported within the laboratory's certified reporting limits.

After determining that the analysis was properly performed, the data were subjected to an IRDMS group check program to determine if valid sites and sample information were entered.

The data were the copied and transferred to the RMA data base manager, who placed all data in a temporary holding file until he was notified by the Army on the decision of which data were accepted or rejected.

3.6.3.1 Quality Control Analysis

Quality control charts were submitted by the laboratory as separate documents. These charts were constructed from data generated during original method certification and updated with data from subsequent spike QC samples within a lot. The charts consist of both tabular and graphic presentations of the control results and include the following:

- Single Day X-R Central Charts - Single day X-R control charts were prepared for each certified analyte using the results (expressed as percent recovery) obtained from duplicate spike QC samples. Charts were updated after each 20 lots, using the most recent 40 points. Points falling outside the established control limits were considered outliers. Data are rejected when:

    1. A value lies outside the control limits.
    2. A series of seven successive points lie on the same side of the mean.
    3. Five successive points go in the same direction.
    4. A cyclical pattern exists.
    5. Two consecutive points lie between the upper warning limit and upper control limit, or the lower warning limit and lower control limit.

- In the case of multi-analyte methods, the total number of out-of-control analytes were evaluated to determine if analyses are rejected. Data were rejected when:

    1. Points for more than two-thirds of the control analytes were out-of-control.
    2. One analyte has consecutive out-of-control points.

- Three-Point Moving Average Control Charts - Results of the control analyte spiked at single low concentration, single high concentration, surrogate spike standard matrix example, or the addition

of spike QC sample (extended ranges) were used to construct X-R three point moving average control charts. Data were rejected when:

1. A value above the upper control limit and classified as an outlier Dixum-Test.
2. Five consecutive points going in an upward direction.
3. A cyclical pattern of central value.
4. Two consecutive points between the upper warning limit and upper control limit.

Woodward-Clyde quality assurance chemists review all of the QA data submitted by the analytical laboratory and propose a summary of recommendations for acceptance or rejection of the various data lots.

3.7 HEALTH AND SAFETY PROGRAM

This section briefly describes the general Health & Safety Program developed for the field activities conducted during this investigative program. Specific Health & Safety requirements and chemical hazard information are discussed in detail in the project Health & Safety Plan (Appendix E of the Final Task Plan).

The purpose of the program was to define the responsibilities of the various involved individuals, define and evaluate the hazards to which workers could be exposed, and develop levels of worker PPE and operational procedures that would minimize the danger to which individuals involved with field activities would be exposed.

The specific Health & Safety requirements developed for this program are described in Section 7.0 of the Health & Safety Plan. The Plan defines the various work zones (i.e., Exclusion Zone, Contamination Reduction Zone, Support Zone), required monitoring equipment, and levels of PPE and action levels for the various field investigative tasks described in the Final Task Plan. Table 3-1 is a summary of the levels of protection required for the various tasks.

To ensure that the required monitoring equipment and levels of PPE were adequately protecting workers, an equipment management program and personnel air sampling program were developed.

TABLE 3-1
LEVELS OF PROTECTION

	Modified Level D	Level C	Level B
Land Surveying	X	Dusty conditions	N/A
Geophysical Surveys	X	Dusty conditions	N/A
Groundwater Sampling M-1	N/A	With engineering controls	Arsine present; OVA or HNu readings above background in breathing zone
Well Development M-1	N/A	With engineering controls	Arsine present; OVA or Nu readings above background in breathing zone
Soil Borings at M-1	N/A	N/A	X
Trenching 36-17	N/A	N/A	X
Soil Borings 36-17	N/A	With engineering controls analytical confirmation of	Lack of analytical and confirmation of no
mustard	mustard		
Groundwater Sampling 36-17	N/A	With engineering controls	OVA or HNu readings above background in breathing zone
Well Development 36-17	N/A	With engineering controls	OVA or HNu readings above background in breathing zone
PPE Decontamination in CRZ	N/A	X	N/A
Equipment Decontamination Initial Steam-cleaning	N/A	N/A	X
Equipment Decontamination Secondary Steam-cleaning	N/A	X	N/A
Respirator and Boot Decontamination	Transport and sanitizing	Initial decontamination	N/A

X - Standard level of protection

3.7.1 Equipment Management Program

The purpose of the equipment management program was to inventory, maintain, calibrate, and track all PPE and monitoring equipment. On a daily basis, all monitoring equipment, including HNus, OVAs, arsine monitor, Draeger tubes, M-18 test kits, M-43 monitors, personal air sampling pumps, and water quality test kits were checked out to the crews involved with intrusive activities. At the end of the day, all equipment was returned to the equipment management trailer. Instruments requiring calibration or recharging were serviced on a daily basis.

3.7.2 Personal Air Monitoring

Personal and/or area air monitoring was conducted at several locations during field activities. The following analyses were performed: arsenic trioxide, arsine, lead, aldrin, dieldrin, dicyclopentadiene, total dust, and hexachlorocyclopentadiene. Air monitoring was conducted under the supervision of the site safety officer and business unit health and safety officer and in accordance with SOP No. 8, Addendum 1 to SOP No. 8, and NIOSH/Occupational Safety and Health Administration (OSHA) methodology. A summary of personal air monitoring is contained in Appendix B. A total of 102 air samples were collected in the field and analyzed for the above listed analytes. In addition, two air samples and 28 bulk material samples were analyzed for asbestos.

3.7.2.1 Methodology

The samples were collected and analyzed according to the methodology published by NIOSH and OSHA. All field samples, along with field blanks, were sent to DataChem, an American Industrial Hygiene Association (AIHA) accredited laboratory in Salt Lake City, Utah, for analysis. Proper sample chain-of-custody procedures were followed. The calculation for equivalent exposures for a mixture of compounds was taken from 29 CFR 1910.1000(d)(2)(i). The equation reads as follows:

$$E_m = C_1/L_1 + C_2/L_2 + \dots + C_n/L_n$$

where

E_m is the equivalent exposure for a mixture

C is the concentration of a particular contaminant
L is the exposure limit for that contaminant

The value of E_m shall not exceed unity.

Two air samples (AS-022 and AS-023) were taken with Tedlar bags from the headspace of the cement mixer during M-1 ISV soil sample mixing operations. The air bag samples were then drawn through charcoal tubes at a rate of 50 ml/minute. The A and B portions of the charcoal tubes were then analyzed by gas chromatography.

3.7.2.2 Results

The majority of samples yielded nondetectable amounts of analytes. Samples for total dust yielded the greatest number of detected analytes, with analytical values ranging from -0.02 to +0.03 milligrams per sample. (A negative value is acceptable due to the analytical error involved in weighing the PVC filters.) Other analytes found were arsine (0.00005 mg/sample) and arsenic trioxide (0.0001 mg/sample). The limits of detection for arsine and arsenic trioxide are 0.00002 mg/sample and 0.0002 mg/sample, respectively.

Of the 102 field samples sent to the laboratory, only samples AS-022 and AS-023 exceeded holding times and were invalidated. Because many compounds can adsorb to or penetrate through a Tedlar bag, gas chromatography analysis should be conducted within 48 to 72 hours after sample collection to obtain good analytical results. Hydrocarbon analysis should be conducted within 24 hours after sample collection to obtain best results.

3.7.2.3 Conclusion

Based on the data presented, there was no significant exposure to the chemicals sampled. A majority of the analytical testing yielded nondetectable amounts of compounds. These results were expected, due to the fact that all of the measured compounds, except arsine, are not significantly volatile (Table 3-2 lists their respective vapor pressures). Although arsine is very volatile, it readily dissipates in air (dissociation constant of 0.906 atm at 0°C; Merck Index, 9th edition, page 109) and on exposure to light, moist arsine decomposes,

TABLE 3-2
VAPOR PRESSURES OF COMPOUNDS

Compound	Vapor Pressure (mm Hg, 20°C)
Arsenic trioxide	Not listed
Arsine	> 1 atm
Aldrin	2.31×10^{-5}
Dieldrin	2.8×10^{-6}
Dicyclopentadiene	1.4
Hexachlorocyclopentadiene	0.08 (at 25°C)
Lead	1.77 (at 1000°C)
Total dust	Not applicable

References: Health & Safety Plan, Appendix C: Toxicity and Hazard Information
NIOSH Pocket Guide to Chemical Hazards

quickly depositing shiny black arsenic (Merck Index, 9th edition, page 109). Arsine was expected to be most prevalent in the M-1 Settling Basin area well headspace.

The more prevalent route of exposure to the chemicals at RMA was assumed to be dermal (skin) due to the nature of the military compounds disposed of at the site. However, due to the personal protective equipment worn by all field personnel, adequate protection was provided. Uncoated tyvek with an outer saranex-coated or poly-coated tyvek for personnel engaged in drilling, trenching, or sampling, and uncoated tyvek was required for all non-intrusive work (for instance, field surveys). Two layers of gloves and boot covers were required at all times. Wrists and ankles were taped at all times during field activities. During some intrusive operations, SCBA face masks were taped to the tyvek hoods to decrease exposed surface areas.

3.8 SAMPLE MANAGEMENT

Soil and water samples were taken at the M-1 Settling Basins, Section 36-17, and the Lime Settling Basins during this field investigation. The detailed sampling program and procedures can be found in Appendix C, the Sampling Design Plan, of the Task Plan for the Remediation of Other Contamination Sources project, issued in June 1989. This section summarizes the sample management procedures and the number and type of samples taken during the field investigation.

3.8.1 Sample Management Procedures

Water samples were collected in previously sealed bottles certified as clean according to EPA protocols. The bottles were received sealed from the analytical laboratory. Plastic bottles were used for metals analysis, and amber glass bottles were used for all other analytes. Waste samples taken from the trenches in Site 36-17 were collected in commercially cleaned amber glass jars. Soil samples taken from borings were collected in decontaminated polybuterate tubes.

All sample bottles and jars were labeled with the sample number and requested analytes before they were taken into the field for sample collection. The person collecting the samples added the date, time, and their initials at the time of sample collection.

Prior to shipment to the lab, samples were placed in a double layer of plastic ziplock bags, wrapped in bubblepack, and placed in coolers containing vermiculite and lined with bubblepack and large plastic trash bags.

All samples were stored in coolers with blue ice from the time they were collected until they arrived at the laboratory. The water samples to be analyzed for metals were preserved with nitric acid.

A chain-of-custody form was completed for each sample, including the sample number, requested analytes, sampler's signature, date and time of the sample, and instructions to the laboratory. A copy of the form was sent to the lab with the sample, and a copy was kept as a record.

3.8.2 Field Samples

A total of 100 field samples were taken from three areas: (1) the M-1 Settling Basins, (2) Site 36-17, and (3) the Lime Settling Basins. A summary of the samples collected and requested analyses is contained in Appedix C.

3.9 WASTE MANAGEMENT

The field activities produced a variety of waste materials that were managed under the Waste Management Program.

Contaminated wastes were classified into three categories: (1) solid waste consisting of auger cuttings or soils removed by other means, (2) water generated during groundwater sampling or decontamination procedures, and (3) PPE used during field activities. Wastes were segregated and handled separately according to their classification.

Waste drums were obtained by the Woodward-Clyde Waste Management Coordinator from the RMA Waste Management Contractor. Drums were numbered, and a log was kept that included the drum number, the date that the drum was obtained from the RMA Waste Management Contractor, the site location where the drum was used, the sample numbers for drums containing soil waste, the date the drum was filled, and the date the filled drum was received by the RMA Waste Management Contractor.

The soil waste drums were filled as the soil was removed from the ground. Waste soils from different sites were not mixed in the same drum. Soil drums were filled to at least 90 percent full. If necessary, surface soils were added to the last drum of waste soil from a site if that drum was not at least 90 percent full. Filled soil drums were covered, sealed, decontaminated, and taken to the RMA Waste Management Contractor for temporary storage. Analytical results for soil samples taken when the waste soil was generated were forwarded to the RMA Waste Management Contractor for characterization of the soil waste in particular drums.

Water generated during well purging, well sampling, and decontamination procedures was temporarily contained in drums. The drums were then pumped into a wastewater tank at the equipment decontamination pad. The wastewater drums were decontaminated and either reused for PPE or returned to the RMA Waste Management Contractor. The RMA Waste Management Contractor was responsible for sampling the wastewater tank and disposing of the water.

Personal protective equipment included tyvek coveralls, gloves, tape, spent respirator cartridges, and boot covers. PPE drums also occasionally held contaminated polyethylene sheeting and other similar materials used in the field that could not be decontaminated. This contaminated waste was placed in numbered drums that were filled to at least 90 percent full. Filled drums were closed, sealed, decontaminated, and taken to the RMA Waste Management Contractor. Appendix D contains a summary of the contents and final disposition of each of the drums used during the project.

3.10 SOIL GAS SURVEY

A soil gas investigation was conducted in July 1989 at the Motor Pool Area in Section 04 of the Western Study Area. A review of previous field studies performed in the Motor Pool Area (Remedial Investigation Final Report Vol. XII, Western Study Area) indicated that trichloroethylene (TCE) soil contamination was present near Buildings 624 and 625. The purpose of the study was to further define the extent of the TCE plume and its possible source.

3.10.1 Equipment Used

Soil gas samples and soil samples were taken by Hydro Geo Chem, Inc. (HGC). The sampling probes consisted of 7-foot sections of 1-inch pipe fitted with a high carbon 1-inch steel machined point that was left in place when the pipe was retrieved to expose the formation to pumping. The probes were driven with a truck-mounted hydraulic driver, and removed using a hydraulically activated pulling dog. All soil and soil gas sampling locations were cleared prior to sampling using an EM-31 conductivity meter and a Schoenstaedt magnetic locator.

A programmable mass flow controller, equipped with a solenoid valve and a vacuum-regulated oiless diaphragm vacuum pump, was used to purge the system and to obtain gas samples. Gas samples were collected in a three-layer adsorptive hydrophobic carbon packing contained in a glass cartridge.

Soil sampling equipment included a 1.5-foot split-spoon sampler with multiple stainless steel liners that attach to the end of the 1-inch pipe rods. The sampler was driven to specified depths in the soil using the hydraulic truck-mounted driver.

Latex surgical gloves were worn during handling and assembling of sampling apparatus. Respirator, saranex, rubber boot covers, and butyl rubber gloves were worn during all equipment decontamination.

A mobile laboratory was used to provide on-site analyses. The analytical equipment used to perform onsite analyses included:

- Enviro Chem 850 Thermal Tube Desorber
- Varian 3400 Gas Chromatograph
- Tracor 700 A Hall Detector
- Tracor 703 PID Detector
- DB 624 30m Megabore column, J.W. Scientific
- Spectra Physics 4100 Integrator
- Varian 3400 Integrator

3.10.2 Decontamination Procedure

Equipment was decontaminated prior to each use and between sampling sites. Decontamination of the soil gas sampling equipment and soil sampling probes, as well as related hardware, was performed with a high pressure steam sprayer. Decontaminated probes were stored in a clean, sealed container on the sampling rig. Soil sample liners were decontaminated by scrubbing with alconox and water, then rinsing with deionized water. Clean liners were wrapped in plastic and transported to the sampling site.

Adaptors and stainless steel bottles were heated to 120°C and held at that temperature for 1 hour. Carbon-packed desorption cartridges were purged with helium at 400°C for 8 minutes. Cartridge holders were heated and purged at > 200°C for 20 minutes.

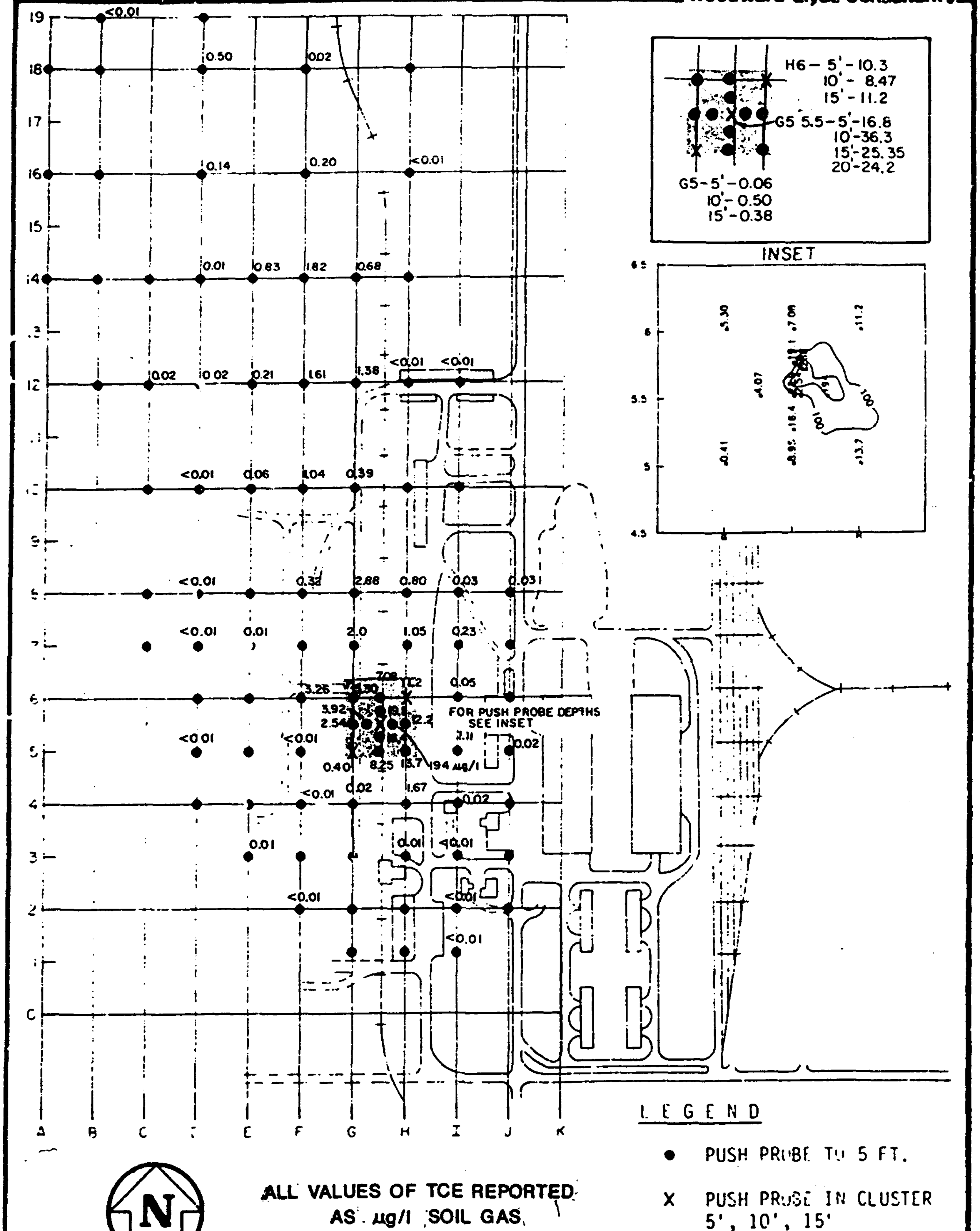
Separate storage areas were provided for used (dirty) and unused (cleaned) equipment. No equipment was reused without cleaning.

3.10.3 Soil Gas Sampling Procedure

The study area was overlaid with a 200-foot by 200-foot grid system and test points identified, then surveyed, staked, and cleared in the field (see Figure 3-1).

The optimal depth for soil gas sample collection was determined at the start of the program by collecting samples from depths of 5, 10, 15, and 20 feet at each of three locations near the previously identified TCE spill source location. Evaluation of the results indicated that, based on reproducibility, the optimal sample collection depth was 15 feet. All remaining soil gas samples were collected from this depth.

The soil gas sampling was performed by driving 7-foot sections of 1-inch drill pipe fitted with a high carbon steel point to the desired sample depth. The probe drill pipe was advanced by a truck-mounted hydraulic driver to the desired depth and then pulled back, leaving the point in place, to expose the formation to pumping.



ALL VALUES OF TCE REPORTED AS µg/l SOIL GAS

Job No.: 22235B	Figure 3-1 TCE SOIL GAS SURVEY MOTOR POOL AREA
Prepared by: C D	
Date: 6/28/89	

Soil gas samples were collected from the probes by drawing soil gas through stainless steel tubing adapters connected to an inline bellows valve leading to a sample holder containing a glass cartridge (Supelco) filled with a three-layer packing made of various types of adsorptive hydrophobic carbon.

After purging three probe volumes from the system, the valve on the adaptor was shut off and the sample cartridge attached to a programmable mass flow controller equipped with a vacuum-regulated oilcss diaphragm vacuum pump. The flow controller was typically programmed to pump 200 ml of soil gas at a flow rate between 100 and 200 ml/min. When the total flow volume was obtained, a solenoid valve automatically closed, and the sample collection was complete.

Soil gas samples were taken at locations that were selected to better delineate a TCE plume previously indicated in the Motor Pool soil. Samples were taken as close as possible to the desired locations, however, some locations could not be cleared due to surface obstructions (buildings).

Quality assurance and quality control were achieved through strict adherence to sampling and testing protocol. System blanks and three calibration runs were performed at the beginning of each day and additional calibrations made after every 8 samples. Prior to each day's sampling, field blanks and system blanks were analyzed for background contamination. Soil gas sample holding times did not exceed 8 hours before actual analysis.

The data were quantified by generating concentration curves based on their area response and known injection standard concentrations. Acceptance of data was based on the response factor of the internal standard being within a standard deviation of ± 15 percent.

Detection limits for the target analytes in the soil gas were calculated to be < 0.01 micrograms per liter (ug/l) and < 0.01 micrograms per kilogram (ug/kg) in the soil.

3.10.4 Soil Sampling

Soil sampling was done using a similar technique as the soil gas sampling. Once the pipe was driven to the desired depth, a split-spoon sampler was placed onto the end of the pipe and driven 1 foot into the soil.

Soil was collected in stainless steel liners located inside the split spoon. Liners were sealed with aluminum foil and tape, and they were immediately transported to the mobile lab.

Soil samples were prepared for analysis by placing approximately 10 grams of soil into a pre-tared VOC vial containing 20 ml of distilled water. The sample was then purged with nitrogen for 15 minutes at 200 ml/min.

The volatile compounds were then trapped on a carbon-packed glass cartridge at 60°C and analyzed in the same manner as noted above.

3.10.5 Field Analyses

A mobile laboratory was used to provide onsite analyses.

Capillary gas chromatography techniques were used to identify and measure concentrations of the target compounds. The cartridges were desorbed at a temperature of 380°C using a *thermal desorption unit*. Samples were then injected by the desorber into a programmable gas chromatograph equipped with photoionization (PID) and Hall conductivity detection capabilities.

Chemical standards were prepared from stock mixture of neat reagent grade compounds. A measured volume of the standard mixture was injected into a nitrogen-filled, 1-liter glass bottle through a septum side port. A measured volume of the gas mixture was then injected into a 200-ml/minute helium stream feeding a carbon-packed glass concentrating cartridge. Standards, blanks, and samples were transferred to the thermal desorber and analyzed.

The volatile organic compounds that were analyzed at each sampling location included the following chlorinated hydrocarbons:

- Trichloroethylene (TCE)
- Trans 1,2 dichloroethylene
- Cis 1,2 dichloroethylene
- 1,1 dichloroethylene

The suite of aromatic compounds analyzed at each sampling location include benzene, toluene, ethylbenzene, m,p-xylenes, and o-xylene. The analysis of compounds listed in method 502.2 were also performed at selected locations to investigate the potential presence of any of the listed compounds.

Duplicate soil gas samples were collected from each sampling location. Duplicate analyses were performed on 10 percent of the samples collected.

3.10.6 Grouting

All holes resulting from soil gas sample collection were backfilled after the sampling program was completed. Holes were filled with a cement/bentonite slurry pumped through a tremie pipe to the bottom of the hole.

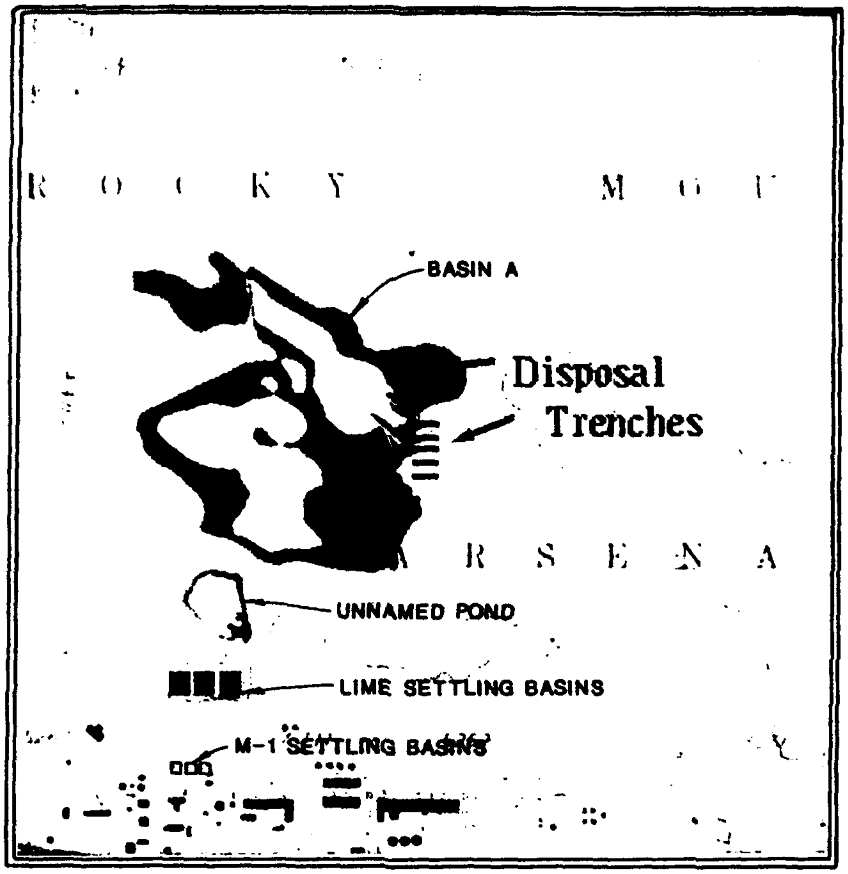
4.0
FIELD INVESTIGATION RESULTS

This section contains the results of the field investigations conducted to gather specific information concerning the four hot spot areas. During development of this sampling program, data from previous investigations were evaluated to determine what additional data would be required to assess the need for, and range of, alternative interim response actions (IRA) for each of the hot spot areas.

The data presented in this section represent only those data specifically sought under the field investigations described in the Task Order 2 Final Task Plan. Data gathered by past remedial investigations are contained in various Contamination Assessment Reports and summarized in the Final Study Area Reports for the seven study areas at the Rocky Mountain Arsenal (RMA). The past data were used along with the new data to evaluate conditions at each site and assess appropriate alternative remedial technologies.

To aid in providing a more accurate location of the M-1 Settling Basins, the Lime Settling Basins, and the Section 36 Trenches an analysis and interpretation of a series of historic aerial photographs of RMA in general and Section 36 in particular was conducted. The photographs specific to Section 36 were important in establishing when and where trench disposal activities were conducted in Site 36-17. The photographs available at the start of this task did not provide continuous annual photo coverage of the trench disposal activities in Site 36-17. Several 3- to 5-year gaps in the coverage left some uncertainty concerning the locations of disposal trenches. In addition, recent technological advancements in computer-enhanced digital image analysis allow photo interpreters to precisely overlay one photo on another to compare changes over time.

During the planning phase of this task, additional aerial photographs of Section 36 were obtained to fill in some of the existing gaps in the historic photo coverage during the mid-1940s. Digital image analysis of the photographs was used to locate and calculate areas of key features in Section 36, the Lime Settling Basins, and the M-1 Basins areas. Figure 4-1 shows the results of digital image analysis performed on a series of aerial photographs from 1944, 1945, 1950, and 1956 of Section 36 and the M-1 Basins area. The composite image shows the actual location of the M-1 Settling Basins and the disposal trenches investigated in Anomalous Area H. The 1956 photo shows that Basin A did inundate several of the disposal trenches.



SCALE: 1 INCH 1400 FEET

LEGEND:

AIR PHOTO DATE		BASIN A ACRES	UNNAMED POND ACRES
1944	□	31.86	3.43
1945	■	32.00	4.53
1950	■	72.10	3.02
1956	■	85.90	3.36

SCALE: 1 INCH=1400 FT.

Job No. : 22238	Figure 4-1 COMPOSITE OF HISTORIC AIR PHOTOS OF SECTION 36 AND THE M-1 BASIN AREA
Prepared by: D.C.C.	
Date: 8/23/89	

4.1 M-1 SETTLING BASINS

Previous investigations conducted in the M-1 Basins area indicated high concentrations of arsenic and mercury in soil within the basins and groundwater downgradient of the M-1 Settling Basins. A number of organic analytes related to pesticide manufacturing activities were also identified in surficial soils.

The investigative program developed for this site was designed to:

- Provide a more accurate location of the basins
- Provide better estimate of the volume of waste in the basins
- Provide additional characterization of the waste material contained in the basins
- Determine if the M-1 Settling Basins are an active source of groundwater contamination

The field program included a geophysical survey, excavation and sampling material from six exploratory trenches and eight soil borings, installation of two new groundwater monitoring wells, and sampling water from the two new wells as well as five existing wells. The sampling program included collection of bulk soil and waste material samples for chemical fixation treatability testing and a bench-scale in situ vitrification (ISV) test. The following sections describe the findings of the field program and present the results of chemical analysis of soil, water, and waste samples collected in the M-1 Settling Basins area under this program.

4.1.1 Geophysics

Prior to the start of intrusive activities in the M-1 Settling Basins, a geophysical survey was performed with an EM-31 terrain conductivity meter. The geophysical survey was performed to ensure that all boring and trenching locations were clear of metallic objects and other debris that could present obstructions to drilling and hazards to field personnel.

EM readings were taken over a 15,000 square foot area. The geophysical grid lines were spaced about 20 feet apart with the long axis running north-south. Lines were generally 200 feet long with stakes every 50 feet.

Both in-phase and out-of-phase EM data were recorded every 2 seconds during each traverse resulting in approximately 20 to 30 readings every 50 feet. Magnetic readings were not taken over all the M-1 Basins area because metal surface structures and piping interfered with the readings. They were taken, however, where the EM data indicated a subsurface anomaly.

Electromagnetic data indicated two conductivity anomalies in the M-1 Basins. These anomalies corresponded to the locations of the ponds in the area. Several underground anomalies interpreted as utilities (pipelines) were found along the northern and western edges of the M-1 site, utilizing both the EM-31 and a Schonstaedt magnetic locator.

Geologic materials encountered in the M-1 Basins consist of either relatively fine-grained soils or limey waste material. The properties of these materials differ greatly, not only physically, but also electrically and magnetically. The geophysical survey was able to identify the boundary between the waste material in the basins and the surrounding natural soils.

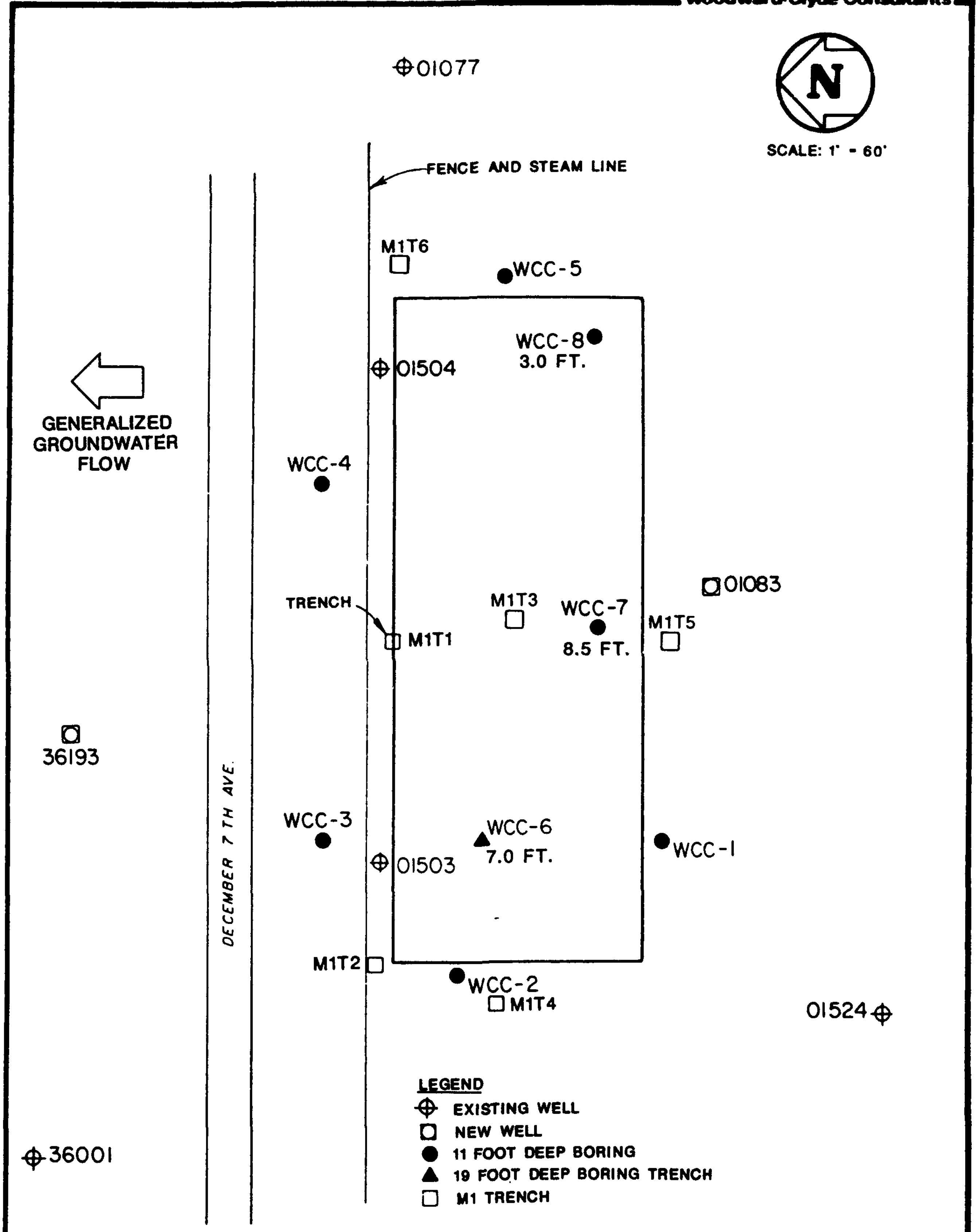
4.1.2 Soil Boring Program

Intrusive activities performed in the M-1 Basins included the completion of 10 soil borings as well as the installation of 2 monitoring wells. Eight borings were completed in and around the M-1 Basins (Figure 4-2). Three soil borings (SB) (SB Nos. 6, 7, 8) are located inside the boundaries of the M-1 Basins. All borings were drilled and sampled using 6-inch diameter hollow stem augers. A 5-foot long split-barrel sampler containing clear polybuterate tubes was used to collect continuous soil samples. Each boring was continuously sampled to total depth and then grouted to ground surface upon completion of drilling and sampling. Drilling procedures are described in detail in Woodward-Clyde Standard Operating Procedure (SOP) No. 2.

Samples sent for chemical analysis were analyzed for either a limited or expanded suite of analytes. Limited suite analytes included:

- Gas chromatography/mass spectrometry (GC/MS) semivolatiles
- Arsenic
- Mercury
- Moisture

Woodward-Clyde Consultants



Job No. : 22238-A

Prepared by : D.C.C.

Date : 11/16/89

M-1 BASINS
IRA SAMPLING PROGRAM
Figure 4-2

Expanded suite chemicals included all the limited suite chemicals plus:

- GC/MS volatiles
- Organochlorine pesticides
- Organosulfur compounds
- Thiodyglycol
- DIMP/DMMP
- Inductively coupled plasma (ICP) metals
- Moisture

Specific sample dates and analyses for each sample are included in Appendix C.

Geologic materials encountered in the borings adjacent to the M-1 Basins consisted predominantly of fine-grained sediments (fine sand and smaller). The following sections contain brief descriptions of the geologic materials and sample intervals at each boring. Boring logs are contained in Appendix E.

SB No. 1 (WCC-1, Figure 4-2) encountered dry, loose to moderately dense, silty sand in the 0- to 4-foot interval. A stiff, damp, clayey silt was present in the 4- to 9-foot interval. At a depth of 9 feet, a dry to damp clay was encountered and was present to the completion depth of 10.2 feet. Samples from four depth intervals were obtained for chemical analysis. Samples collected from 0.3 to 0.8 foot, 2.4 to 2.9 feet, and 9.5 to 10 feet were analyzed for the limited suite of analytes. A sample was obtained from the 4- to 6.5-foot sample and analyzed for the expanded suite of analytes.

In SB No. 2, (WCC-2, Figure 4-2) loose, dry, sandy silt was present at the ground surface, grading slowly to a firm to soft, damp, silty to very silty clay, which was present to the completion depth of 10 feet. Samples for chemical analysis were obtained from four depth intervals. Samples collected from 0.5 to 1 foot, 2.5 to 3 feet, and 9.5 to 10 feet were analyzed for the limited suite of analytes. A sample was taken from the 4- to 5-foot interval and analyzed for the expanded suite of analytes.

SB No. 3 (WCC-3, Figure 4-2) encountered loose, silty sands from ground surface to the completion depth of 10.5 feet. Samples for chemical analysis were obtained from three depth intervals. Samples collected from 2- to 2.5-foot and 9- to 10-foot intervals were analyzed for the limited suite of analytes. Analysis for

the limited suite of analytes was also performed on a duplicate sample from the 9- to 10-foot sample. A sample was taken from the 4- to 5-foot interval and analyzed for the expanded suite of analytes.

SB No. 4 (WCC-4, Figure 4-4) also encountered loose, silty sands from ground surface to total depth of 9.5 feet. Samples obtained from the 2.5- to 3-foot and 9- to 9.5-foot intervals were analyzed for the limited suite of analytes. A sample taken from the 4- to 5-foot interval was analyzed for the expanded suite of analytes. A rinsate sample was also taken on the decontaminated sampling tool.

SB No. 5 (WCC-5, Figure 4-5) encountered loose, slightly wet, silty sand from ground surface to an approximate depth of 6.1 feet. A firm to stiff, wet, silty clay was then encountered until the completion depth of 8.5 feet. Samples for chemical analysis were taken from three different depth intervals. Samples from the 0- to 0.5-foot and 2- to 2.5-foot intervals were analyzed for the limited suite of analytes. The sample from the 4- to 5-foot interval was analyzed for the expanded suite of analytes.

Boring (well) No. 01083 (Figure 4-2) encountered a loose, slightly wet, silty sand to an approximate depth of 4.8 feet. At this depth, a firm, very wet, sandy silty clay was encountered to a depth of 6 feet. From a depth of 6 to 17 feet, a loose, very wet, silty sand was present. At 17 feet, a hard siltstone with coarse-grained sand and gravel was present to a total depth of 18.75 feet. Samples were obtained from three different depth intervals. Samples from the 2.5- to 3-foot and 7.5- to 8-foot intervals were analyzed for the limited suite of analytes. The sample from the 4- to 5.5-foot interval was analyzed for the expanded suite of analytes. Groundwater monitoring wells were installed in Boring Well Nos. 01083 and 36193. Geologic materials encountered inside the boundaries of the M-1 Basins consisted of fine-grained sediments as well as waste material. SB No. 6 (WCC-6) consisted of moderately dry, dense silty sand from ground surface to a depth of 2.1 feet, whereupon the soil became mixed with the underlying waste material. Only waste material was present from depths of 2.6 to 6.5 feet. The waste material was a very soft, wet, gray, silty to clay-like material that turned to a semi-liquid state when agitated. From 6.5 to 7 feet, a zone of mixed soil and waste material was encountered. At a depth of 7 feet, a loose, moist to wet, silty sand was encountered to a depth of 13.9 feet. At this depth, a crumbly to blocky, relatively dry claystone was found extending to the completion depth of 19 feet. Samples for chemical analysis were obtained from three different depth intervals. The 4- to 6.5-foot interval sample was analyzed for the expanded suite of analytes. Samples from the 8- to 8.5-foot and 19- to 20-foot intervals were analyzed for the limited suite of analytes.

SB No. 7 (WCC-7, Figure 4-2) encountered loose, dry sandy silts from ground surface to a depth of 1.2 feet where this material graded into a stiff, slightly moist clayey silt. Soft, damp to moist, gray, silty to clay-like waste material was present from 2.4 to 8 feet. Moderate to dense silty sands were present from 8 feet to completion depth of 9.5 feet. Samples were obtained from two depth intervals. The sample from the 7- to 8-foot interval was analyzed for the expanded suite of analytes. The sample from the 8.5- to 9-foot interval was analyzed for the limited suite of analytes.

SB No. 8 (WCC-8, Figure 4-2) encountered gravel fill from ground surface to a depth of 0.3 foot. A loose, very wet, silty sand was encountered to a depth of 2.5 feet. At a depth of 2.5 feet, a 0.5-foot thick layer of firm, gray, silty to clay-like waste material was encountered. At 3 feet, a loose, very wet, silty sand was encountered to completion depth of 9 feet. Only one interval was sampled for chemical analysis. The 4- to 5-foot interval was analyzed for the expanded suite of analytes. A rinsate sample was taken on the sampling tool and also analyzed for the expanded suite of analytes.

4.1.3 Groundwater Monitoring Well Installation and Sampling

The groundwater investigation performed in the M-1 Basins Area consisted of sampling seven wells, including two new wells installed during this program and five existing wells. Two of the wells (one of these new) are upgradient of the M-1 Settling Basins. The remaining five wells are located downgradient or adjacent to the basins. All of the groundwater monitoring wells are located outside the boundaries of the M-1 Basins (Figure 4-2). Table 4-1 is a summary of the M-1 Basins well characteristics. Monitoring wells MW36193 and MW01083 were installed during the Task 2 field investigation activities. Detailed monitoring well installation procedures and specifications are included in SOP No. 2. Additional well information may be found in boring logs, groundwater observation well reports, and a well development summary table, which are included as Appendixes E, F, and I, respectively.

Well locations were chosen in order to monitor groundwater in areas upgradient and downgradient from the M-1 Basins. Groundwater flow in this area is to the north-northwest. Wells MW01083 and MW01524, located south of the M-1 Basins, are upgradient wells used to monitor background water quality. The

TABLE 4-1
M-1 BASINS WELL SUMMARY

Well No.	Screened Interval (ft)	Formation	Water Elevation (ft)	Reason Sampled
36001	5253.8-5243.3	Alluvial	5251.7	Downgradient of M-1 Settling Settling Basins; upgradient of Lime Settling Basins
36193	5254.9-5246.1	Alluvial	5252.8	Downgradient of M-1 Settling Basins; upgradient of Lime Settling Basins
01077	5185.2-5174.8	Denver	NA*	100 feet east of the M-1 Settling Basins
01083	5257.2-5248.4	Alluvial	5256.5	Upgradient of M-1 Settling Basins
01503	5253.5-5243.5	Alluvial	5255.9	Downgradient of M-1 Settling Basins
01504	5254-5244	Alluvial	5255.3	Downgradient of M-1 Settling Basins
01524	5249.7-5239.7	Alluvial	5257.7	Upgradient of M-1 Settling Basins

* Well sampled immediately after the CMP sampling. Water level not taken because of drawdown.

remainder of the wells (MW01077, MW01504, MW01503, MW36001, and MW36193) are located downgradient or adjacent to the M-1 Basins and monitor possible contamination emanating from the basins. Wells MW36001 and MW36193 also serve as background monitoring wells located upgradient of the Lime Settling Basins.

The primary contaminants of concern associated with the M-1 Settling Basins are arsenic and mercury. *Groundwater monitoring* wells located immediately adjacent to the M-1 Basins (MW01077, MW01083, MW01503, MW01504, and MW01524) were sampled for four parameters: (1) filtered arsenic, (2) nonfiltered arsenic, (3) filtered mercury, and (4) nonfiltered mercury. Monitoring wells on the extreme southern edge of Section 36, MW36001 and MW36193, were sampled for the above parameters as well as GC/MS volatiles, organochlorine pesticides, organosulfur compounds, thiodiglycol, DIMP/DMMP, and ICP metals. These additional analyses were performed to better characterize possible contamination upgradient of the Lime Settling Basins.

4.1.4 Treatability Testing

This section contains the results of treatability tests performed to evaluate the effectiveness of ISV and chemical fixation of the M-1 Settling Basins waste.

4.1.4.1 In Situ Vitrification Treatability Test

Field investigations conducted at the M-1 Settling Basins included exploratory trenching. Six trenches were excavated for the purpose of defining basin boundaries, screening samples for military chemical agents, and for the acquisition of soil and waste materials for bench scale ISV tests. The locations of the exploratory trenches are shown in Figure 4-2.

Trench M-1T-1 (Figure 4-2) was excavated perpendicular to the northern edge of the center basin to confirm the location of the basin. Trench M-1T-2 was dug approximately 10 feet from the northwestern corner of the M-1 ponds in an undisturbed area. Soil from these two trenches was screened for surety agents. Trenches M-1T-3 through M-1T-6 were used to obtain samples for chemical fixation and ISV treatability tests.

Trench M-1T-3 was dug to the waste material/natural soil contact in the approximate center of the M-1 Basins. Trench M-1T-4 is located 10 to 15 feet west of the northwestern corner of the M-1 Basins. Trench M-1T-5 is located 10 to 15 feet south of the south centerline in the M-1 Basins. Trench M-1 T-6 is located 10 to 15 feet east of the northeastern corner of the M-1 Basins.

Materials obtained from the trenches were mixed in a decontaminated cement mixer in order to achieve homogeneous samples. The field waste material sample was placed inside a 30-gallon steel drum. Natural soil material was placed in two 55-gallon steel drums. These samples were then sent to GeoSafe Corporation in Kirkland, Washington, to undergo a bench-scale ISV treatability test. ISV sampling procedures are contained in SOP No. 4.

Geologic materials encountered outside the M-1 Basins consist predominantly of loose, slightly wet to wet, fine-grained silty sands. This material was present above and below the waste material contained in the M-1 Basins. The waste material is markedly different from the natural soil. It can best be described as a semi-solid, gray, silty to clay-like material that turns into a semi-liquid state when agitated.

4.1.4.2 Chemical Fixation Treatability Test

The field investigation at the M-1 Settling Basins included sending a portion of the M-1 Basins sludge to Kiber Associates for a chemical fixation treatability test. The material was analyzed before and after chemical fixation by EPA TCLP protocols by DataChem, Inc. The results of the analytical work are shown in Table 4-2.

4.1.5 Analytical Program

This section contains the findings of the chemical analytical program conducted to analyze soil, water, and waste samples collected in the M-1 Settling Basins area during the field program. Table 4-3 shows the findings of M-1 Settling Basins soil and waste sample analyses. Table 4-4 shows the findings of the ground-water sampling. (Because of their length Tables 4-3 and 4-4 have been placed at the end of Section 4.0.) QA/QC data associated with the samples are contained in Appendix H, QA Data Analysis.

TABLE 4-2
CHEMICAL FIXATION TREATABILITY TEST RESULTS
M-1 SETTLING BASINS

Method	Analyte	Before (mg/L)	Limits of Detection (mg/L)	After (mg/L)
EPA #7060	Arsenic	1,100	5	ND
EPA #7470	Mercury	610	.2	56

4.1.6 Data Interpretation

For this IRA, to assess if any of the sites should be considered active groundwater contamination sources, alluvial groundwater samples were collected from upgradient and downgradient wells and compared to evaluate if the downgradient well indicated a significant increase in any of the target analytes. Then, the soil sampling data were reviewed to evaluate if any soil/waste samples from between the upgradient and downgradient wells indicated a concentration of any of the target analytes that could be considered a possible source. Generally, a greater than one order of magnitude increase in the downgradient concentration of a particular analyte was judged to be a significant increase, and a trench soil sample concentration of more than approximately 1,000 ppm was considered a possible source. In most cases, target analyte concentrations in soil were greater than 1,000 ppm in the identified source areas and ranged up to percent level concentrations of arsenic in the M-1 Settling Basins.

This section contains a discussion of the data collected at the M-1 Settling Basins during the field investigations conducted to assess IRA alternatives. The sampling and analytical program developed for this investigation was designed to further characterize the waste material in the M-1 Settling Basins, to evaluate if any of the contaminants in the basins are entering the groundwater, and to evaluate the treatability of the waste by appropriate remedial technologies. The discussion in this section includes data collected during previous investigations conducted in the M-1 Settling Basins area to provide additional information concerning the contaminant distribution and concentration ranges in this area.

4.1.6.1 Waste Characterization

Based on operational history and sample analysis, the primary contaminants of concern in this area were arsenic and mercury. However, dicyclopentadiene, hexachlorocyclopentadiene, and cadmium were also detected at concentrations greater than 3,000 $\mu g/g$ in M-1 Settling Basins soil samples during previous investigations. The type of contaminants detected during this sampling program and their range in concentration was consistent with previous sampling conducted in the M-1 Settling Basins area. As shown in Table 4-3, the concentration of arsenic and mercury detected in waste samples collected during this investigation ranged up to approximately 3.4 percent and 0.4 percent, respectively. In addition, bicyclopentadiene, dicyclopentadiene, OCPs, and ICP metals were detected in M-1 Basins waste samples within their previously established ranges.

Some question concerning the exact location of the M-1 Settling Basins was evident based on inconsistencies between existing reports and a construction drawing (Plan Number 7164-2216) of the M-1 Settling Basins, dated September 25, 1942. Digital image analysis of an aerial photograph of the site taken July 29, 1945 supported the location indicated on the construction drawing. This position was later verified in the field by excavating an exploratory trench perpendicular to the northern edge of the M-1 Settling Basins to expose the contact between the waste material and the edge of the berm. The northwest corner (top inside berm) of the M-1 Settling Basins is located 75 feet south of the centerline of December 7 Avenue and 25 feet east of the contaminated sewer line. The overall dimensions of the basins measure 115 feet (N-S) x 305 feet (E-W) from top inside berm to top inside berm.

4.1.6.2 Contaminant Migration

Previous sampling of downgradient groundwater wells indicated the contaminants arsenic and mercury were migrating out of the M-1 Settling Basins attached to filterable soil particles. Evidence of this is found in the difference in concentrations of arsenic and mercury between filtered and nonfiltered water samples from Well Nos. 01503 and 01504. However, water samples collected from the wells during this sampling program, as well as a new downgradient well (No. 36193) indicate that most of the arsenic detected in downgradient wells will pass through a 0.45 micron filter, which indicates that the arsenic and mercury are in a mobile phase.

Groundwater samples from wells downgradient of the M-1 Setting Basins indicate the concentration of arsenic in filtered samples (using a 0.45 micron filter) ranged from 3,920 µg/ℓ in Well No. 36193 (located approximately 150 feet downgradient) to 20,000 µg/ℓ in Well No. 01504 (located in the berm approximately 5 feet downgradient of the waste material). Table 4-4 is a summary of target analyte concentrations in wells upgradient and downgradient of the M-1 Settling Basins.

Further evidence of lateral arsenic migration out of the M-1 Settling Basins in groundwater can be seen through evaluation of soil samples from downgradient soil borings. The concentrations of arsenic in four of the soil samples taken from above the water table in Boring Nos. M1BORE003 and M1BORE004 were less than the method detection limits for arsenic in soil (2.5 µg/g). However, the concentration of arsenic in the soil samples taken below the seasonal water table was 110.0 µg/g and 41.0 µg/g for Boring Nos. M1BORE003 and M1BORE004, respectively.

A contaminant distribution map showing the concentration of arsenic in upgradient and downgradient groundwater samples is presented in Figure 4-3. The trend showing a significant increase in the arsenic concentration in downgradient groundwater samples indicates that the basins are an active groundwater contamination source.

4.2 COMPLEX DISPOSAL TRENCHES

Previous investigations confirmed the presence of at least 46 disposal trenches or pits within the anomalous areas of Site 36-17 area (Figure 4-4). Evaluation of existing information provided the basis for selecting the trenches investigated under this program. Evaluation criteria included the depth to groundwater, indicated presence of Army agent degradation products, concentration of contaminants, and indications of groundwater contamination.

The investigative program developed for this site consisted of a geophysical survey, excavation of and sampling waste from, a series of exploratory trenches, installation of 6 new groundwater monitoring wells, and sampling the 6 new wells, and 11 existing wells located upgradient and downgradient of the disposal trenches. The following sections describe the field investigations and present the results of chemical analyses performed on soil, groundwater, and waste samples collected during the field program.

4.2.1 Geophysics

Before the start of intrusive trenching/boring activities in Site 36-17N, a geophysical survey was performed using an EM-31 terrain conductivity meter and an EDA OMNI plus magnetic radiometer. This geophysical survey was performed to identify the approximate locations of the original Army disposal trenches and to clear boring locations where needed. The ends of the disposal trenches, as defined by the geophysical survey, were staked with green lathe with green plastic survey tape strung between them. The orientation of the anomalies indicated by geophysics generally correlated with the locations and orientation of disposal trenches shown on an air photo from 1945. All initial exploratory trenches were excavated at the staked location. Additional exploratory trenches were sometimes needed to accurately locate some of the disposal trenches as discussed in Subsection 4.2.2.

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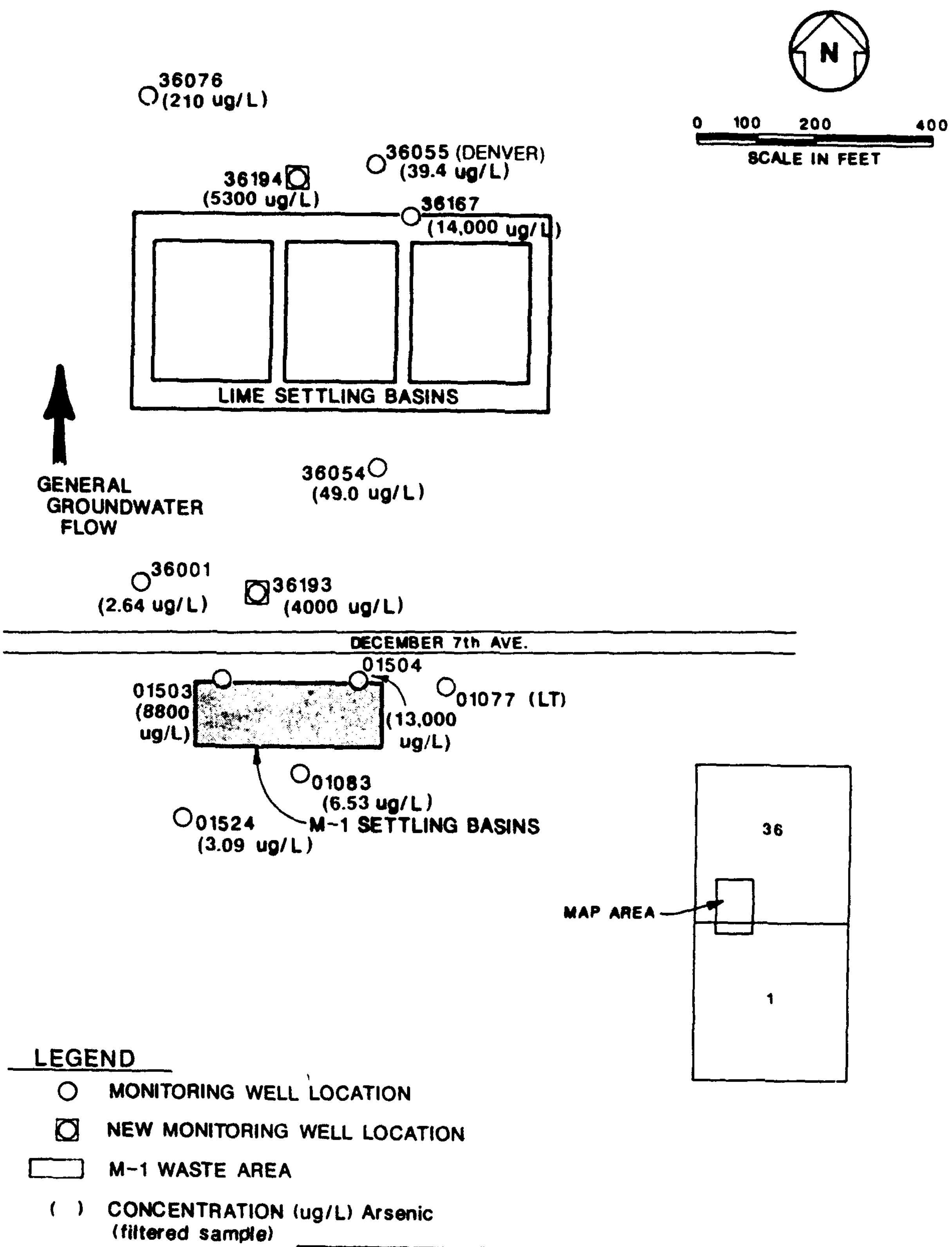
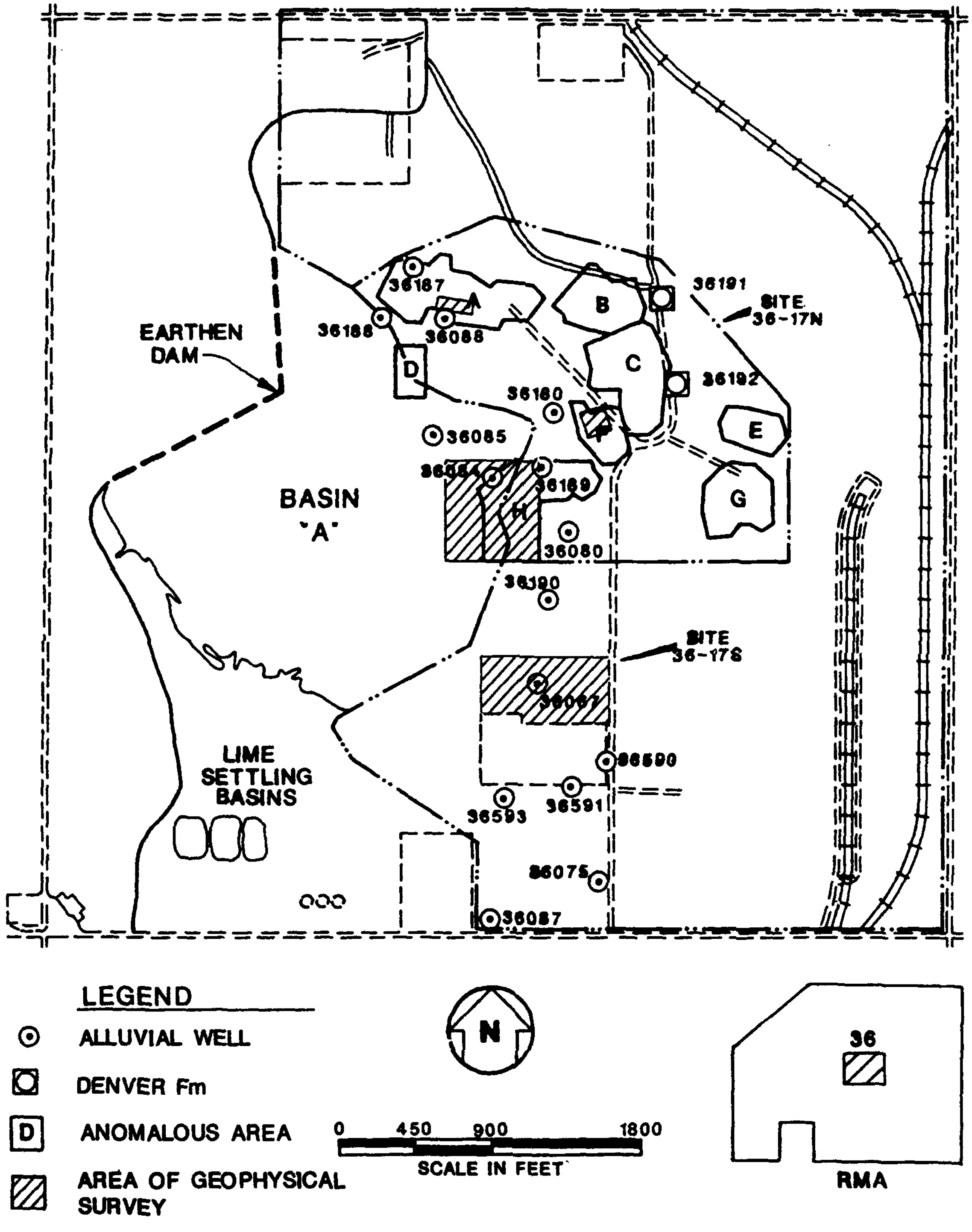


Job No. : 22238-A	M-1 AND LIME SETTLING BASINS FILTERED ARSENIC CONCENTRATIONS IN GROUNDWATER
Prepared by : D.C.C.	
Date 11/16/89	Figure 4-3



Job No. : 22238-A	SITE 36-17 FIELD INVESTIGATION AREAS Figure 4-4
Prepared by : D.C.C.	
Date : 11/16/89	

Magnetometer and EM readings were taken over a 294,000 square foot area. Line spacings were 20 feet apart from east to west for approximately 420 feet. Lines were generally 700 feet long with stakes every 50 feet. Traverses along the west side of the survey grid were generally smooth and made data collection easy. The eastern-most lines were more difficult to traverse due to uneven terrain, numerous excavations, and large pieces of metal on the ground. Metal on the surface tended to interfere with locating buried anomalies.

Magnetic readings were taken every 5 feet on a portion of the traverses in Site 36-17. Both total field and gradient recordings were made, and base station recordings were taken at the beginning and end of each data collection period.

Electromagnetic data collected in Site 36-17 indicated several elongated anomalous regions trending generally east to west. These anomalies are marked by extreme lows in both in-phase and out-of-phase readings taken by the EM-31 meter.

Magnetic records taken in Site 36-17 neither conclusively supported nor refuted the EM-31 findings. For this reason, most magnetic recordings were later discontinued as inconclusive and ineffective.

4.2.1.1 Anomaly A

EM readings were taken over a 60,000 square foot area. The grid lines were spaced 20 feet apart from east to west for 300 feet. Lines were generally 200 feet long with stakes every 50 feet. Magnetic readings were not taken in this area because they were previously shown to be inconclusive.

Electromagnetic data collected in Area A indicated a large elongated anomaly trending east to west through the center of the area, as well as two smaller anomalies lying parallel and adjacent to the larger anomaly. The anomalies were marked by extreme lows in the electromagnetic data.

4.2.1.2 Anomaly F

EM readings were taken over a 20,000 square foot area. The grid lines were spaced 20 feet apart from northwest to southeast for 200 feet. Lines were generally 100 feet long with stakes every 50 feet. Magnetic readings were not taken in this area because they were previously shown to be inconclusive.

Electromagnetic data collected in Area F indicated one weak anomaly trending northwest to southeast in the northwest portion of the area. This anomalous area was marked by extreme lows and moderate highs in the electromagnetic data.

4.2.1.3 Anomaly H

EM readings were taken over an approximately 360,000 square foot area. The grid lines were spaced 20 feet apart from north to south for approximately 600 feet. Lines were generally about 600 feet long with stakes every 50 feet.

Electromagnetic data collected in Area H indicated several elongate anomalies trending east to west. One of the anomalies extended out the west side of Area H toward Basin A. The anomalies were marked by extreme lows in the electromagnetic data.

4.2.1.4 North of Pesticide Pits

EM and magnetometer readings were taken over a 138,000 square foot area. The grid lines were spaced 20 feet apart from east to west for 460 feet. Lines were 300 feet long with stakes every 50 feet. All traverses were generally smooth, making it easy to collect data. Metal on the surface as well as numerous well casings tended to interfere with identification of deeper anomalies. Magnetic readings were taken every 5 feet on a portion of the traverses north of the pesticide pits and every 10 feet on the rest. Both total field and gradient recordings were made and base station recordings were taken at the beginning and end of each data collection period.

4.2.2 Soils/Waste

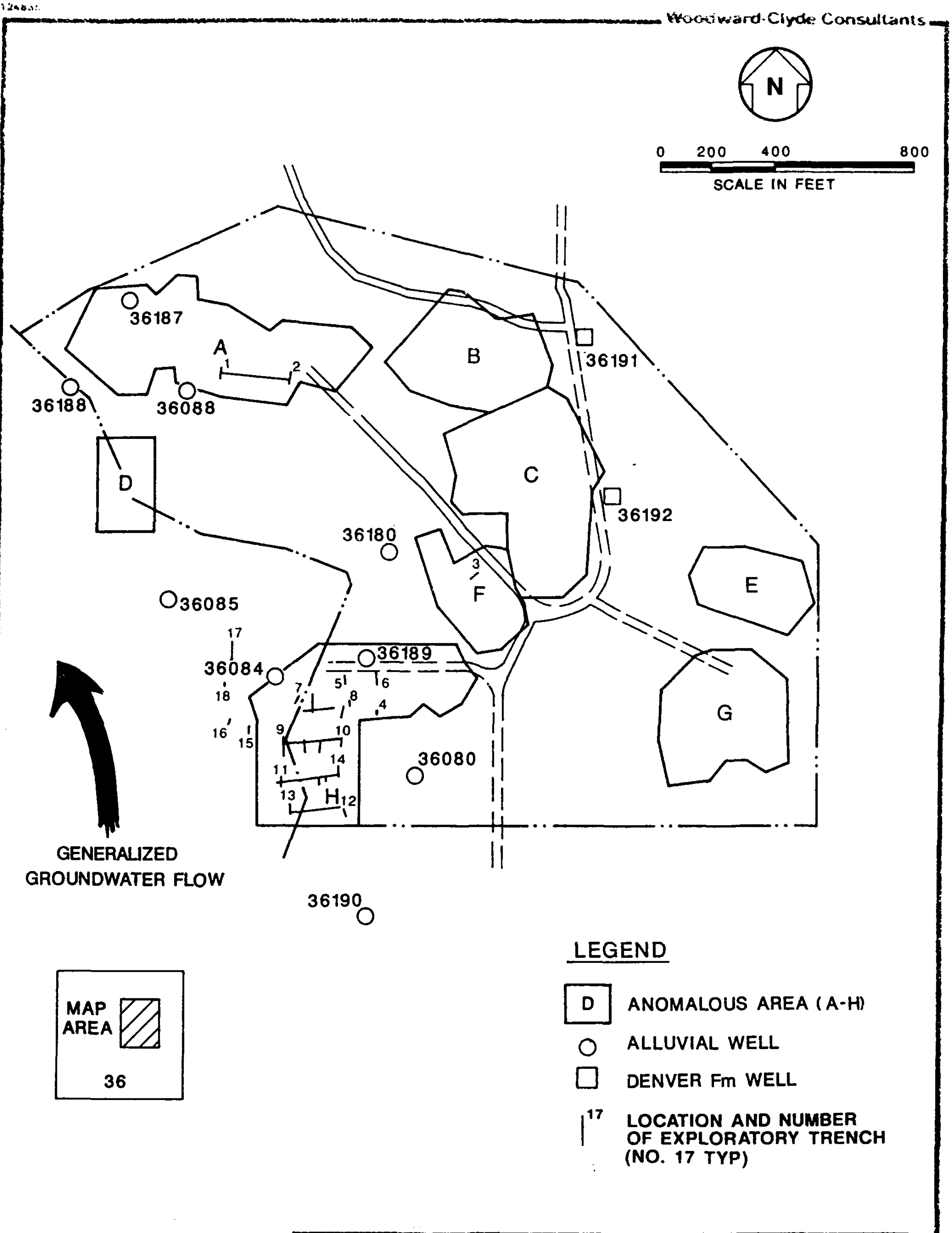
The Task Plan called for 14 exploratory trenches to be excavated through burial trenches identified during the geophysical program and 4 soil borings to be advanced through 4 of the exploratory trenches. During the trenching program it became apparent that additional exploratory trenches would be necessary in Area H to adequately define the limits and orientation of the burial trenches.

In addition, burial trenches were not found at two of the planned trench boring locations (one in Anomaly F and one in Anomaly H) and, therefore, those two borings were not installed. The actual investigative program in the Site 36-17N trench area consisted of 25 exploratory trenches and 2 soil borings below the burial trenches. Four of the additional exploratory trenches were excavated along the west side of Area H to investigate several geophysical anomalies identified in that area. Figure 4-5 is a base map of Site 36-17N showing the areas investigated during this program. Figure 4-6 is an enlargement of Anomalous Area H showing the locations of the exploratory trenches and disposal trenches. Table 4-5 is a summary of the findings in each exploratory trench. Cross-sections of each trench are contained in Appendix G. Figures 4-7 to 4-12 are plan view and cross-sectional views of each of the disposal trenches identified by this investigation.

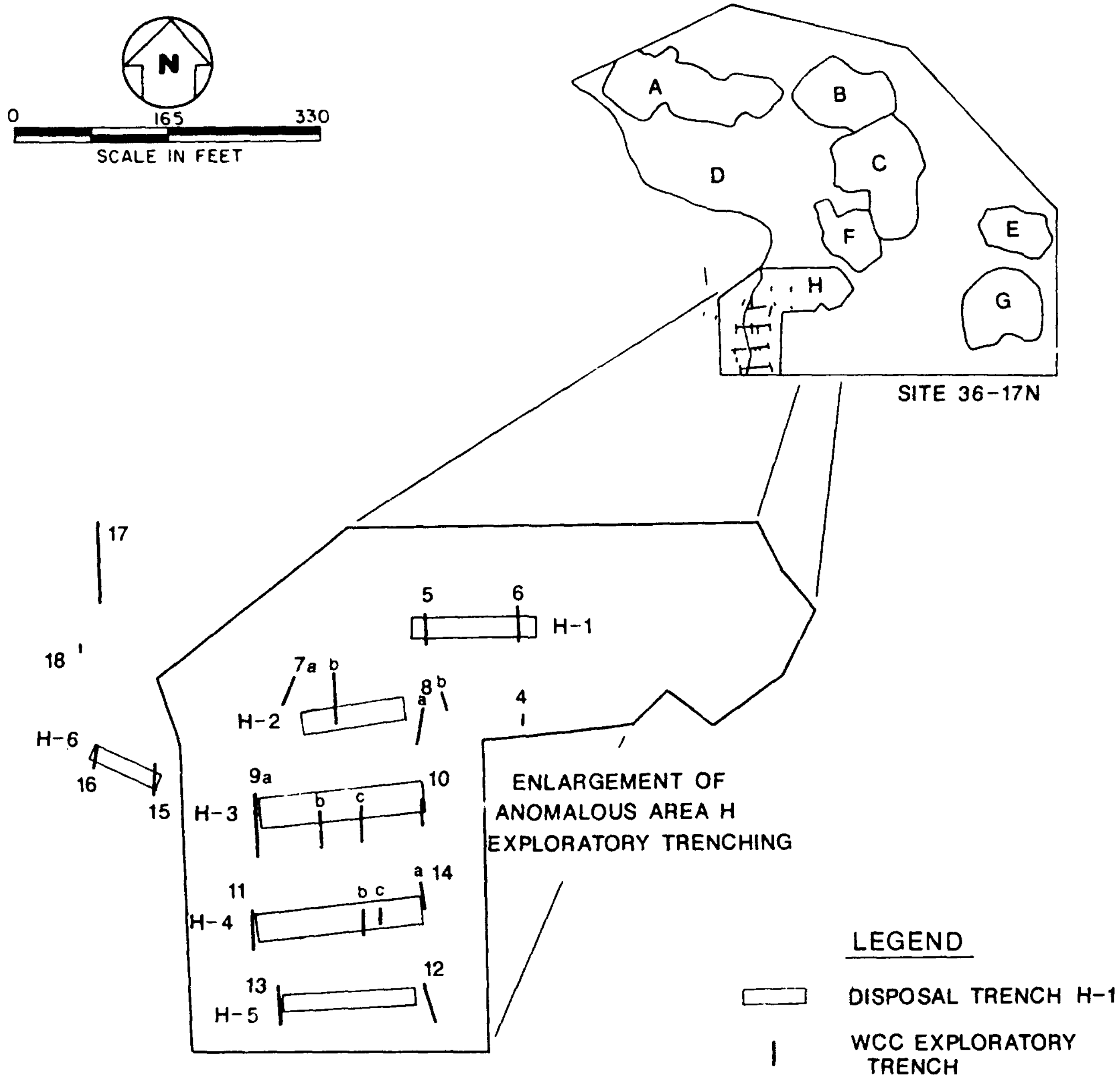
Soil samples were collected from the exploratory trenches just above the bottom contact of the waste material and native soil and just above the free groundwater level in the soil borings advanced through the trenches. The samples were used to evaluate the nature and extent of contamination in the trenches and to assess contaminants that may have migrated from the trenches to the surrounding soil.

4.2.2.1 Anomalous Area A (Site 36-17N)

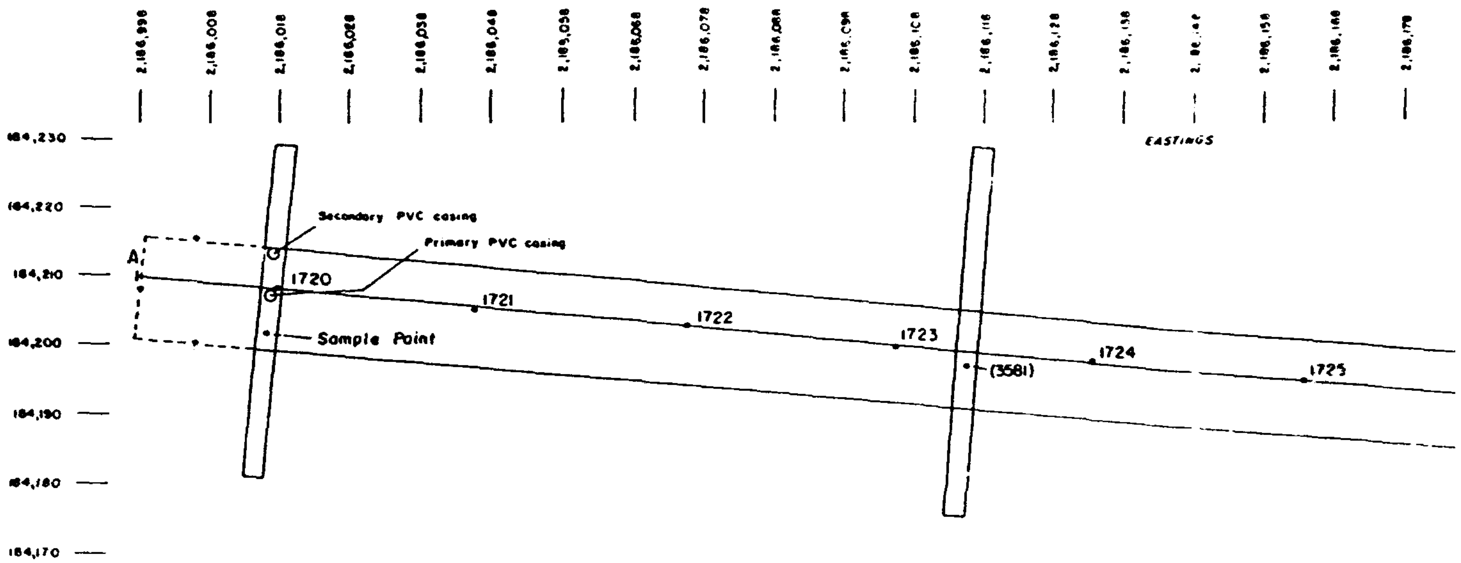
Two exploratory trenches were excavated in Anomalous Area A between the stakes marking each end of the indicated geophysical anomaly (disposal trench A-1) (Figure 4-4). Significant debris fields were encountered in both exploratory trenches. The debris consisted of wire, steel straps, burned-out incendiary device casings, and various pieces of scrap metal. Two 10-inch diameter, schedule 80 PVC pipes were placed in each exploratory trench (one pipe as a backup) to act as surface casings for the soil borings to be advanced below the trench at a later date. Both ends of the pipes were covered with plastic sheeting and



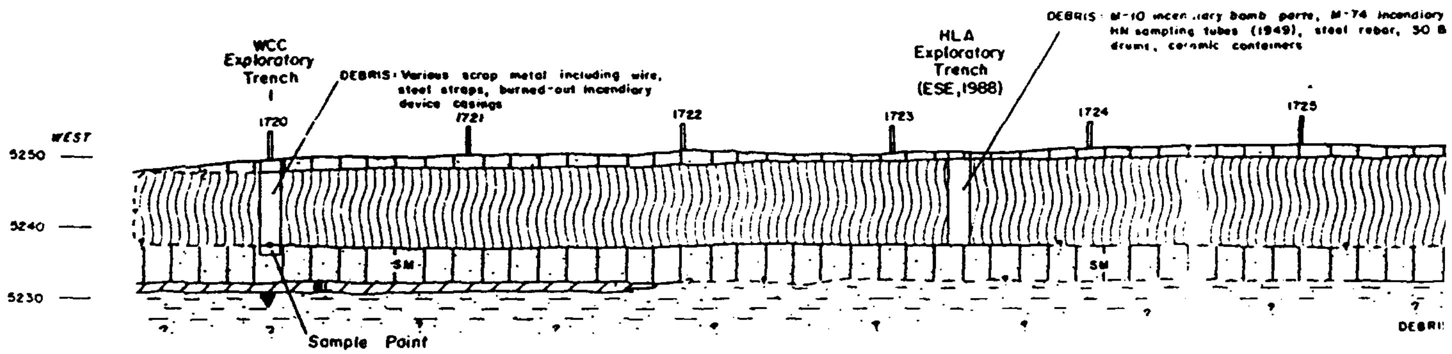
Job No. : 22238-A	SITE 36-17N BASE MAP Figure 4-5
Prepared by: D.C.C.	
Date: 11/16/89	



Job No. : 22238-A	LOCATION OF EXPLORATORY TRENCHES IN ANOMALOUS AREA H
Prepared by: D.C.C.	Figure 4-6
Date: 11/16/89	



Plan View



Cross Section

LEGEND

DISPOSAL WASTE/DEBRIS

SILTY SANDS
SAND/ SILT MIXTURES

SANDY SILT

SILTY SAND w/ 2" TO 3"
LENSES OF SILTY CLAY (SM w/cl)

(3581) PIT BORING SAMPLE POINT (HLA, 1989)

▼ WATER LEVEL AT TIME OF PIT BORING

1720 • 2" X 2" CENTERLINE STAKES

124835

(1)

(2)

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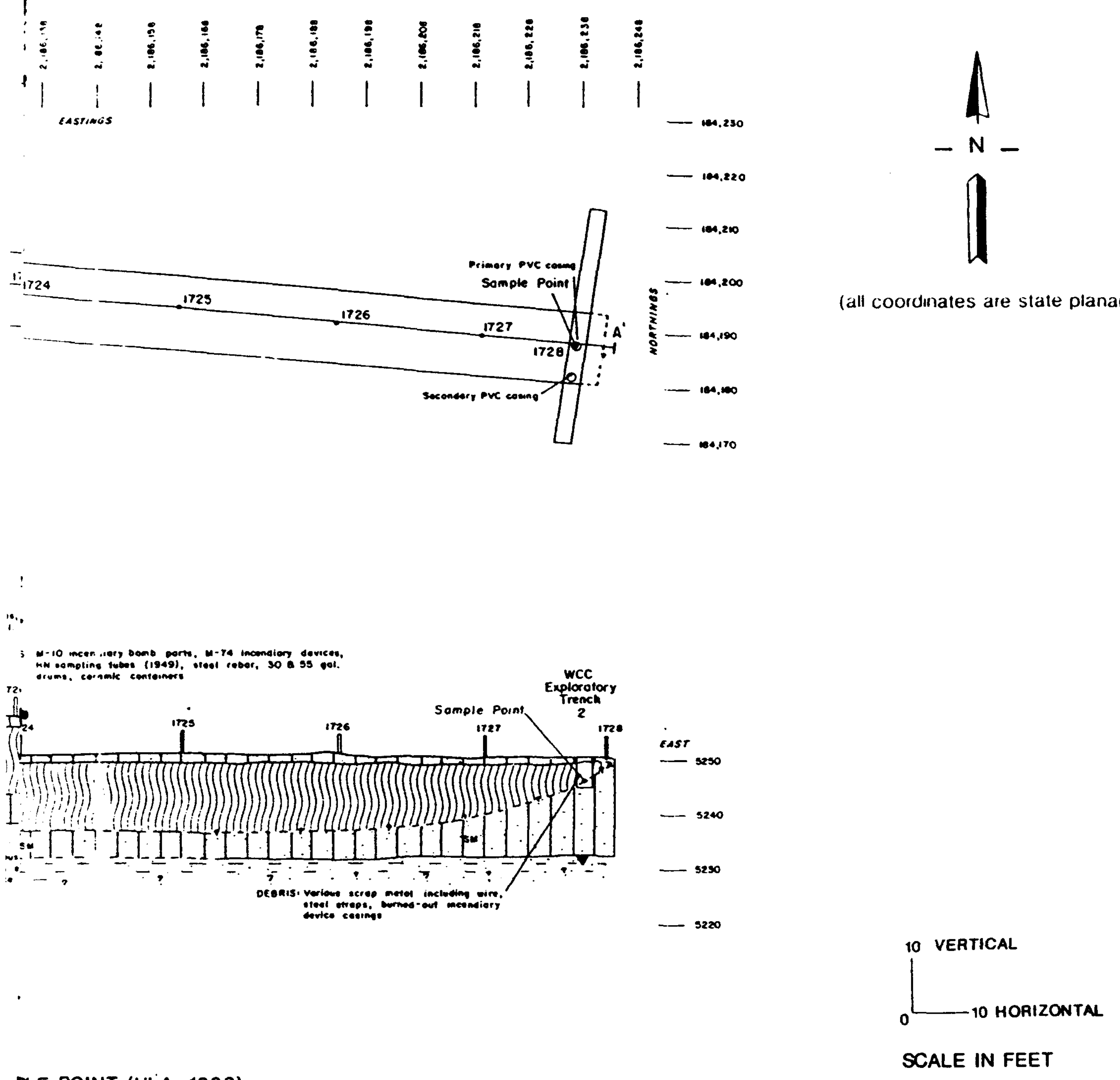
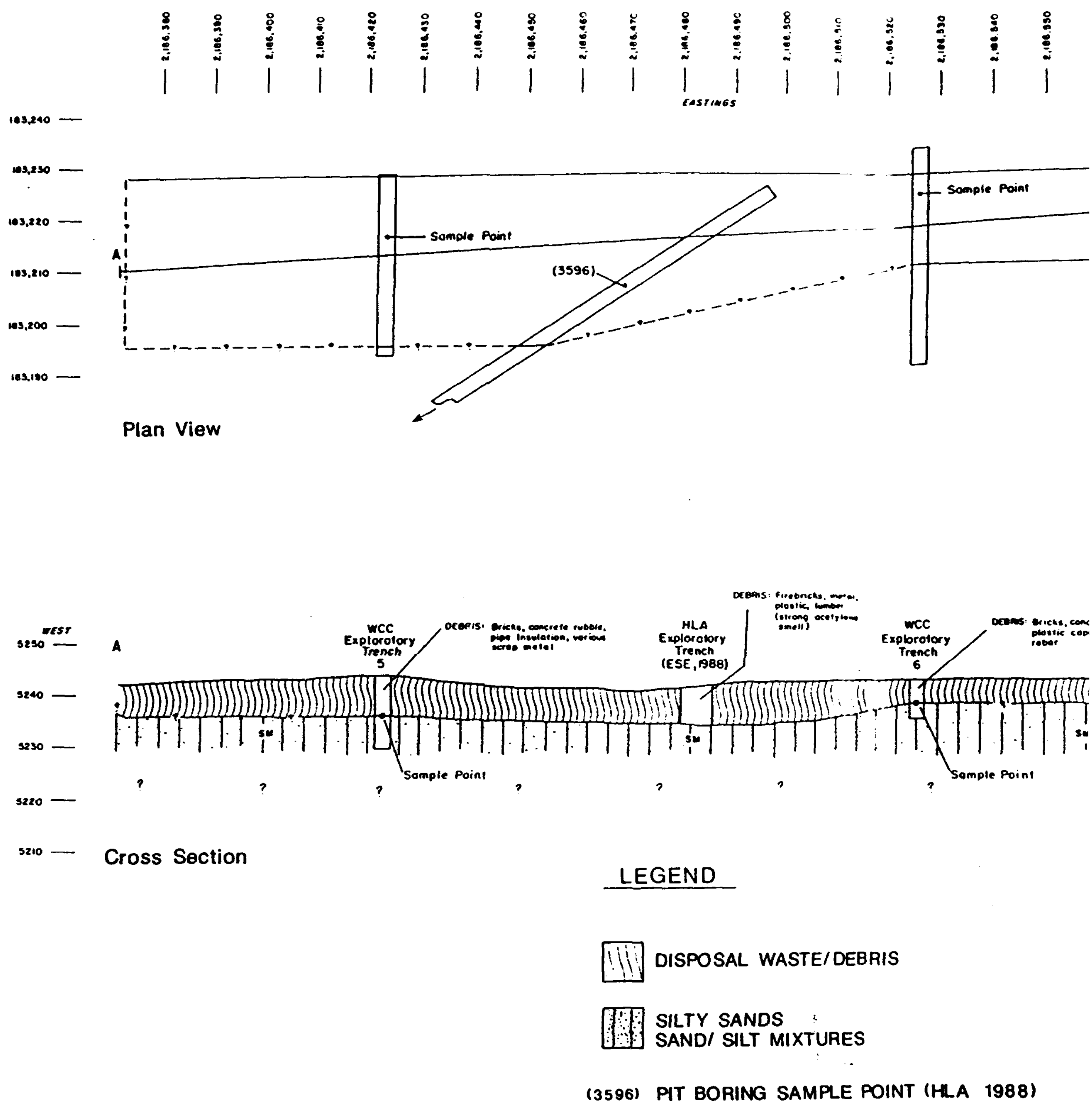


PLE POINT (HLA, 1989)

TIME OF PIT BORING

INE STAKES

Job No. : 22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH A1/ ANOMALOUS AREA A SITE 36-17N Figure 4-7
Prepared by : S.M.	
Date : 8/16/89	

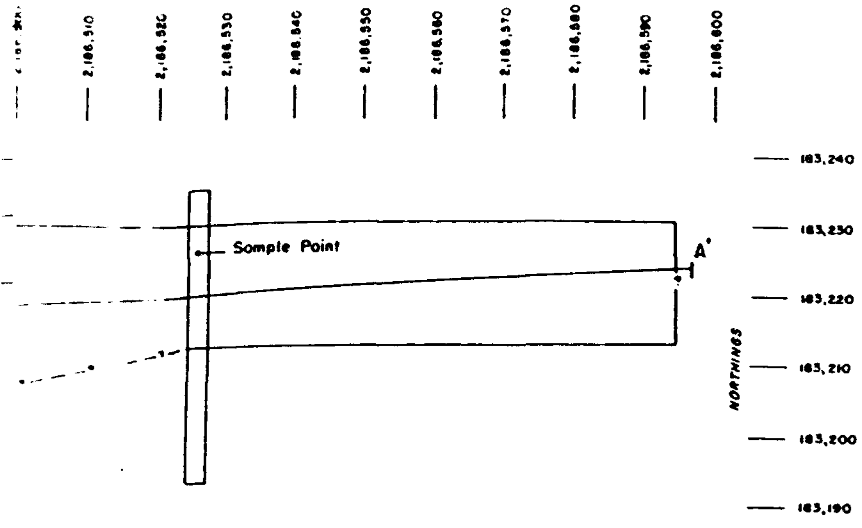


EASTINGS
2,186,390
2,186,400
2,186,410
2,186,420
2,186,430
2,186,440
2,186,450
2,186,460
2,186,480
2,186,500
2,186,530
2,186,540
2,186,550
183,240
183,230
183,220
183,210
183,200
183,190
A
Sample Point
(3596)
Sample Point
Plan View
WEST
5250
5240
5230
5220
5210
A
WCC
Exploratory
Trench
5
DEBRIS: Bricks, concrete rubble, pipe insulation, various scrap metal
HLA
Exploratory
Trench
(ESE, 1988)
DEBRIS: Firebricks, metal, plastic, lumber (strong acetylene smell)
WCC
Exploratory
Trench
6
DEBRIS: Bricks, conc
plastic cap
rebar
SM
SM
Sample Point
Sample Point
?
Cross Section
LEGEND
DISPOSAL WASTE/DEBRIS
SILTY SANDS
SAND/ SILT MIXTURES
(3596) PIT BORING SAMPLE POINT (HLA 1988)

124636

1

2



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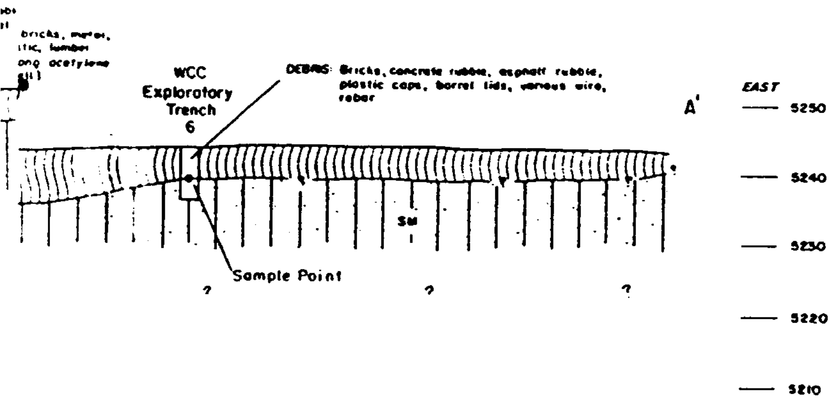
(all coordinates are state planar)



10 VERTICAL
0 10 HORIZONTAL
SCALE IN FEET

STE/DEBRIS

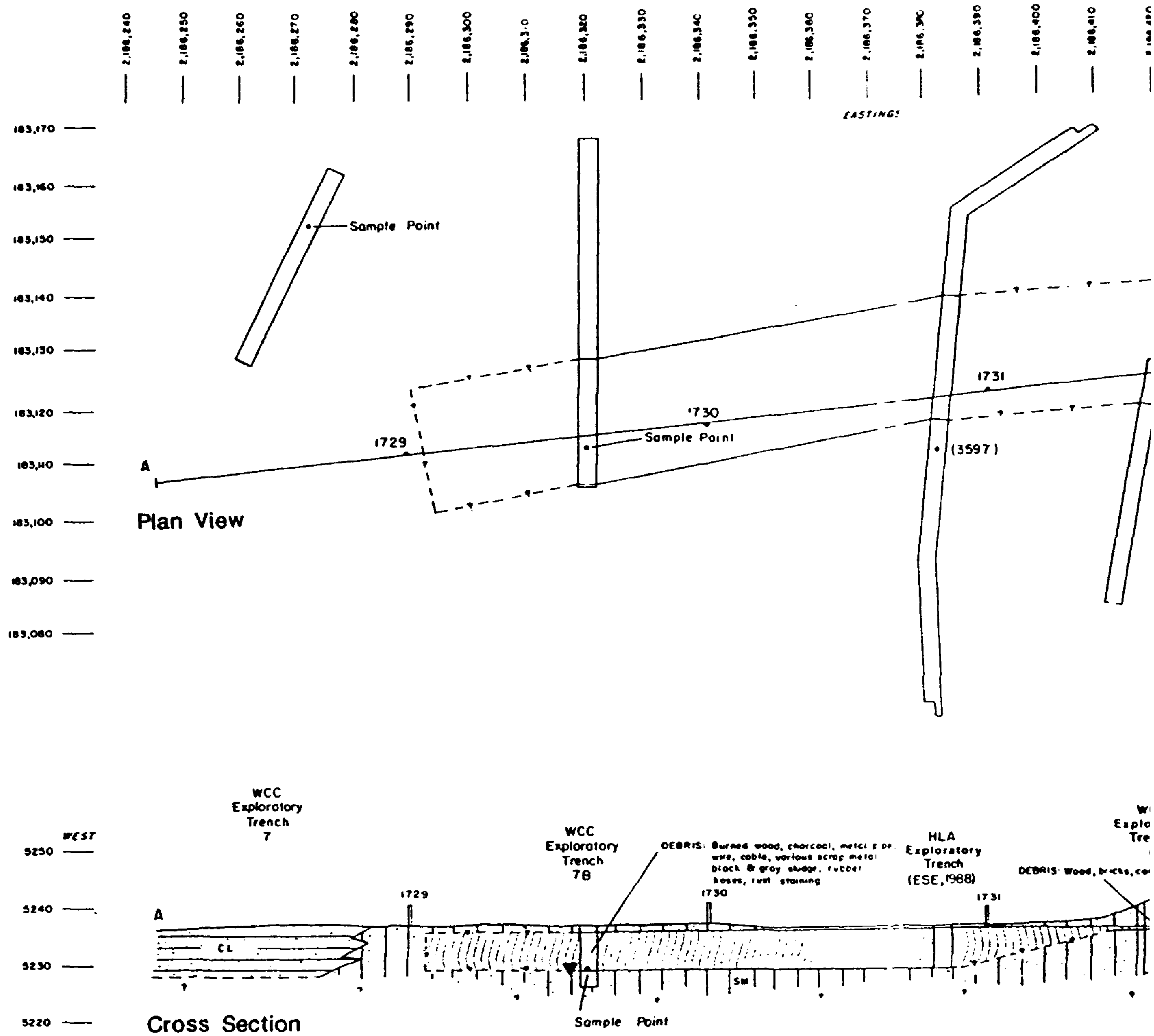
XTURES

AMPLE POINT (HLA 1988)

Job No. : 22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH H1/ ANOMALOUS AREA H SITE 36-17N Figure 4-8
Prepared by : S.M.	
Date : 8/16/89	

2

3



LEGEND

DISPOSAL WASTE/DEBRIS

SILTY SAND
SAND/ SILT MIXTURES

SANDY SILTY
CLAY (low plastic)

▼ WATER LEVEL AT TIME OF TRENCHING

1729
● 2" X 2" CENTERLINE STAKES

(3597) PIT BORING SAMPLE POINT (HLA 1988)

124835

①

②

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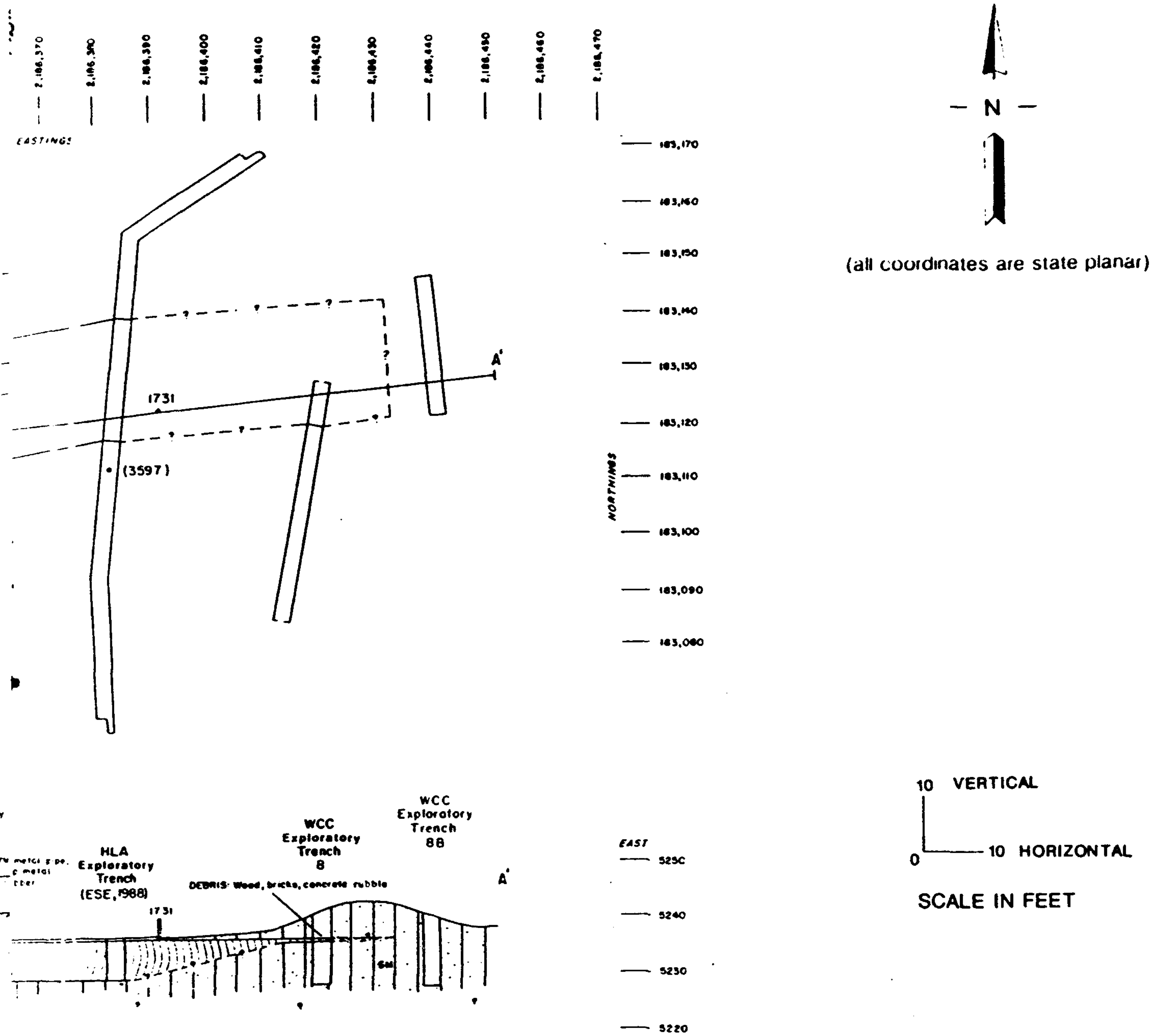


ME OF TRENCHING

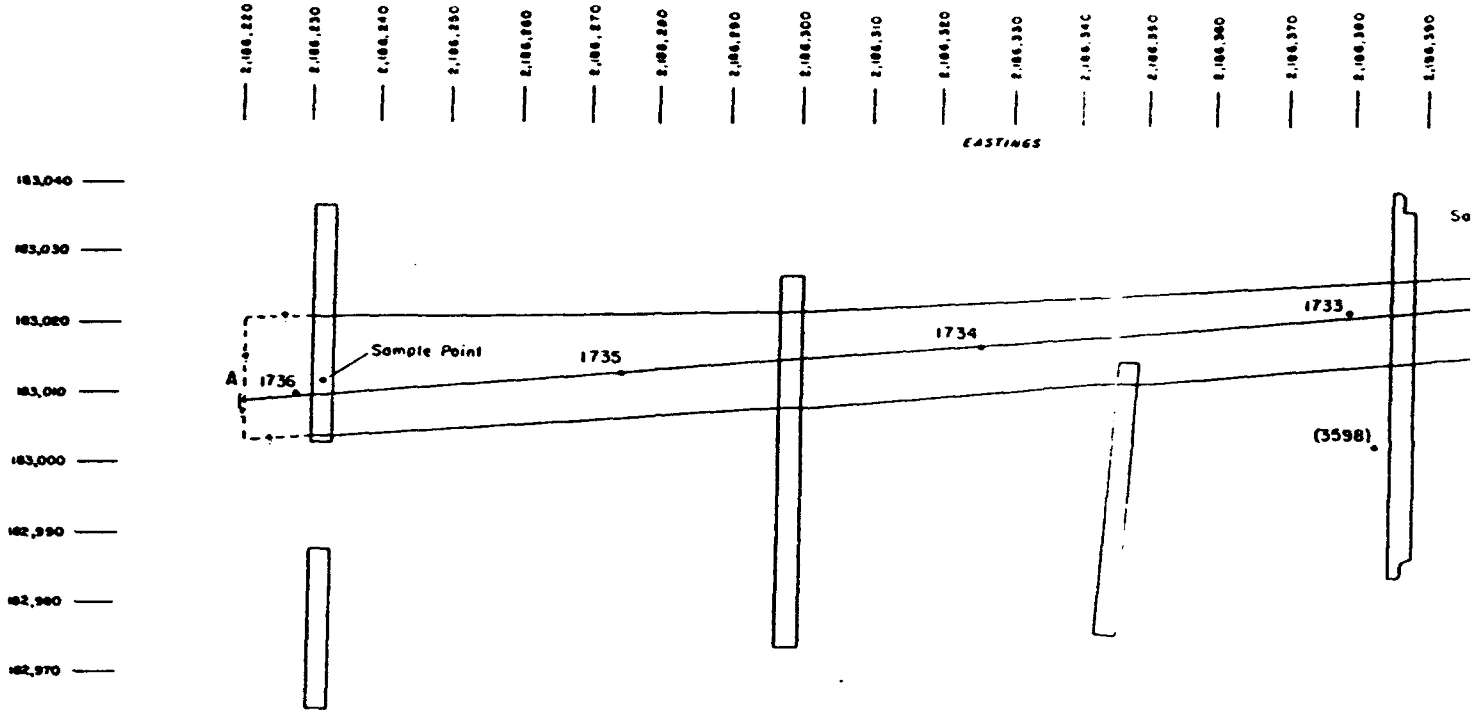
E STAKES

E POINT (HLA 1988)

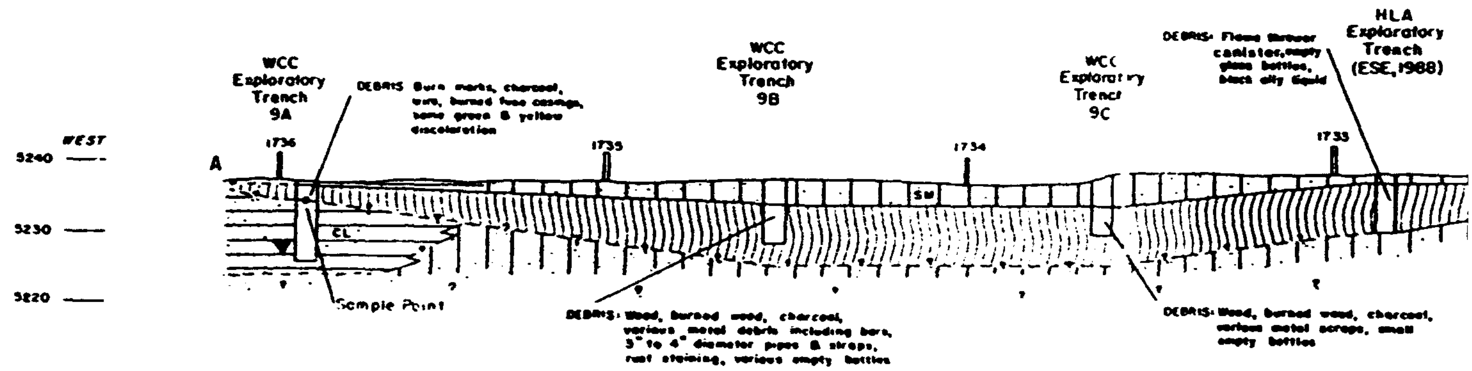
Job No. : 22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH H2/ ANOMALOUS AREA H SITE 36-17N Figure 4-9
Prepared by : S.M.	
Date : 8/16/89	

(2)

(3)



Plan View



Cross Section

LEGEND

DISPOSAL WASTE/DEBRIS

SILTY SANDS
SAND/ SILT MIXTURES

SANDY/ SILTY
CLAY (low-med plastic)

▼ WATER LEVEL AT TIME OF TRENCHING

1736
● 2" X 2" CENTERLINE STAKES

(3598) PIT BORING SAMPLE POINT (HLA 1988)

124835

(1)

(2)

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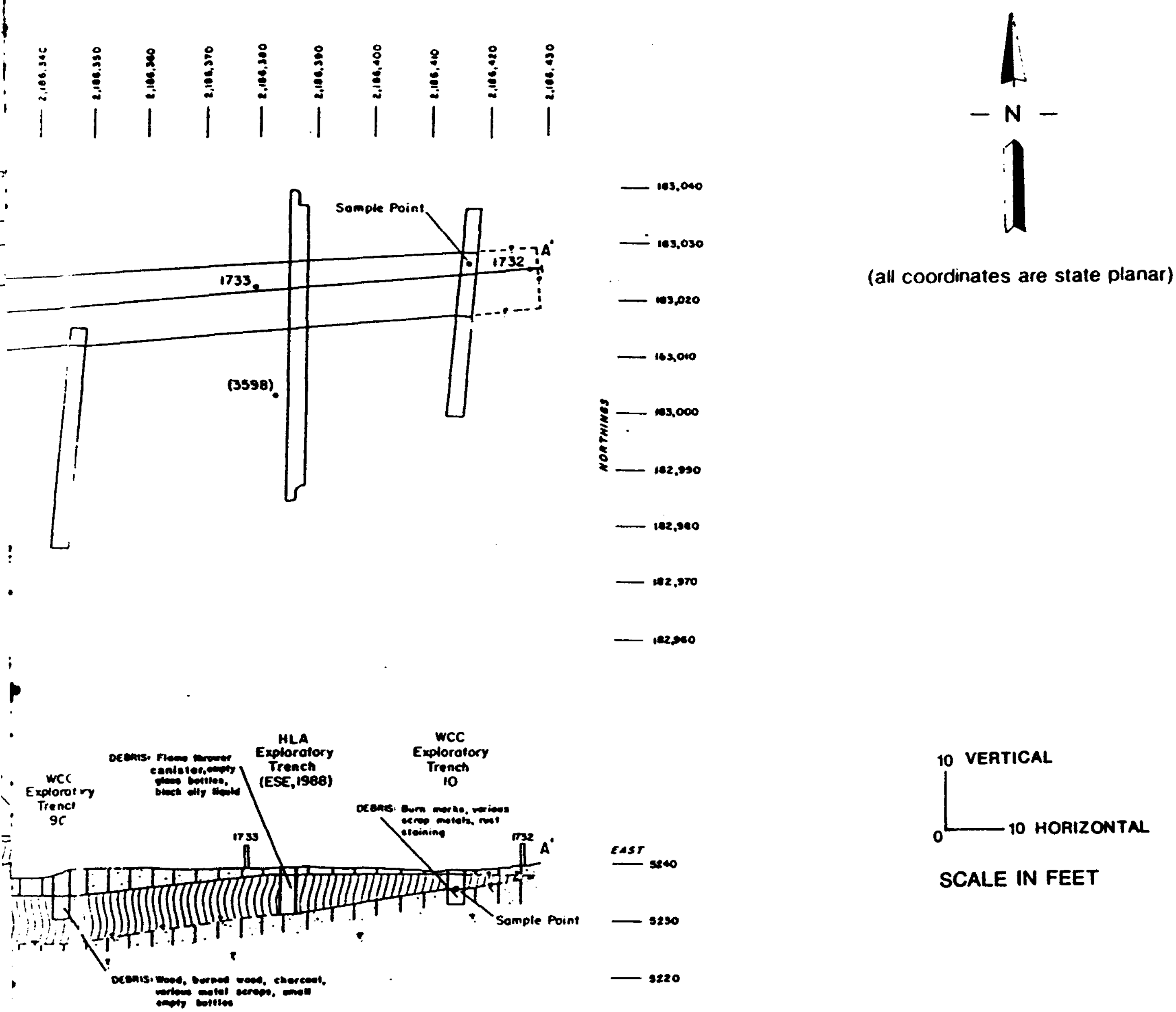


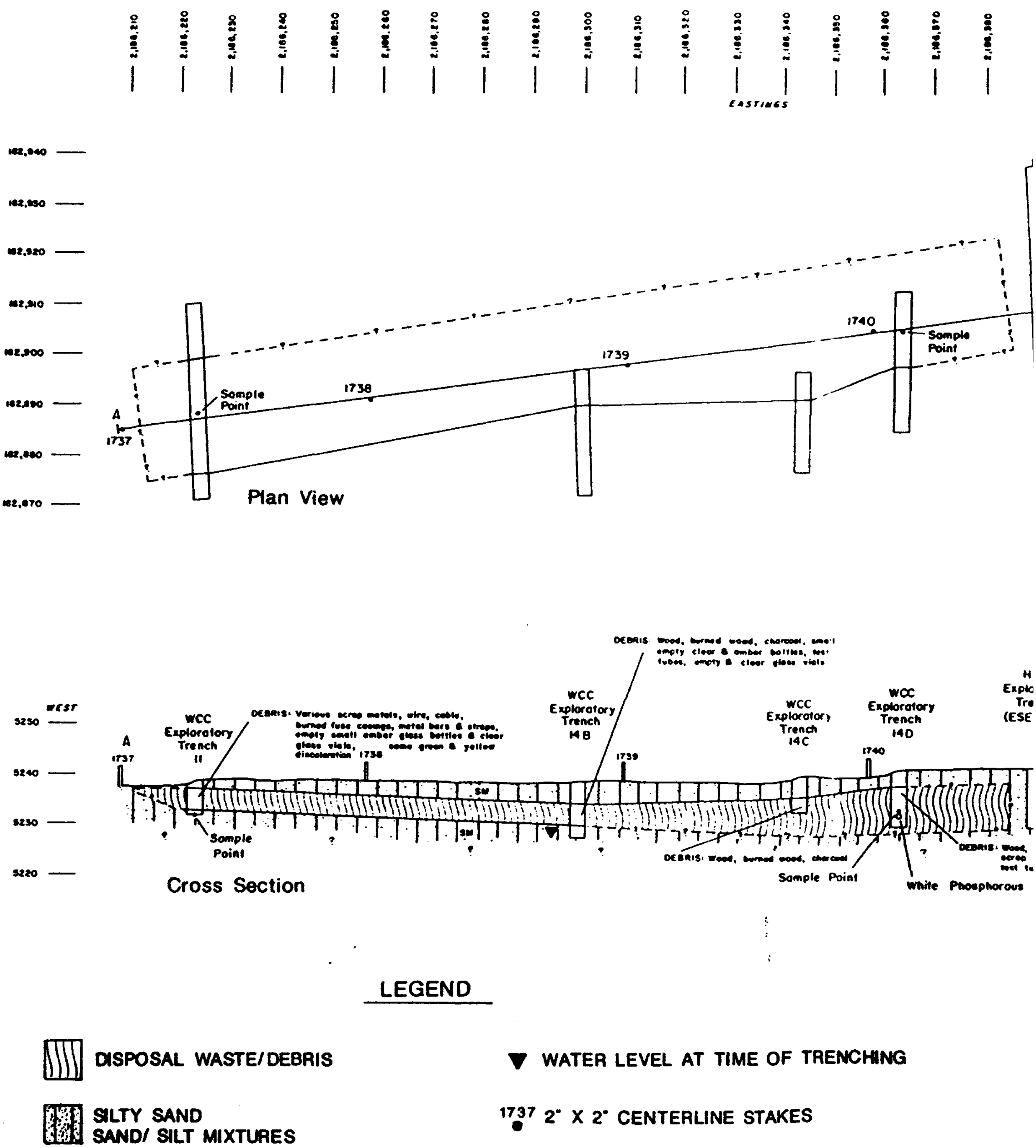
TIME OF TRENCHING

NE STAKES

LE POINT (HLA 1988)

Job No. : 22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH H3/ ANOMALOUS AREA H SITE 36-17N Figure 4-10
Prepared by : S.M.	
Date : 8/16/89	

(2) (3)


2,186,210
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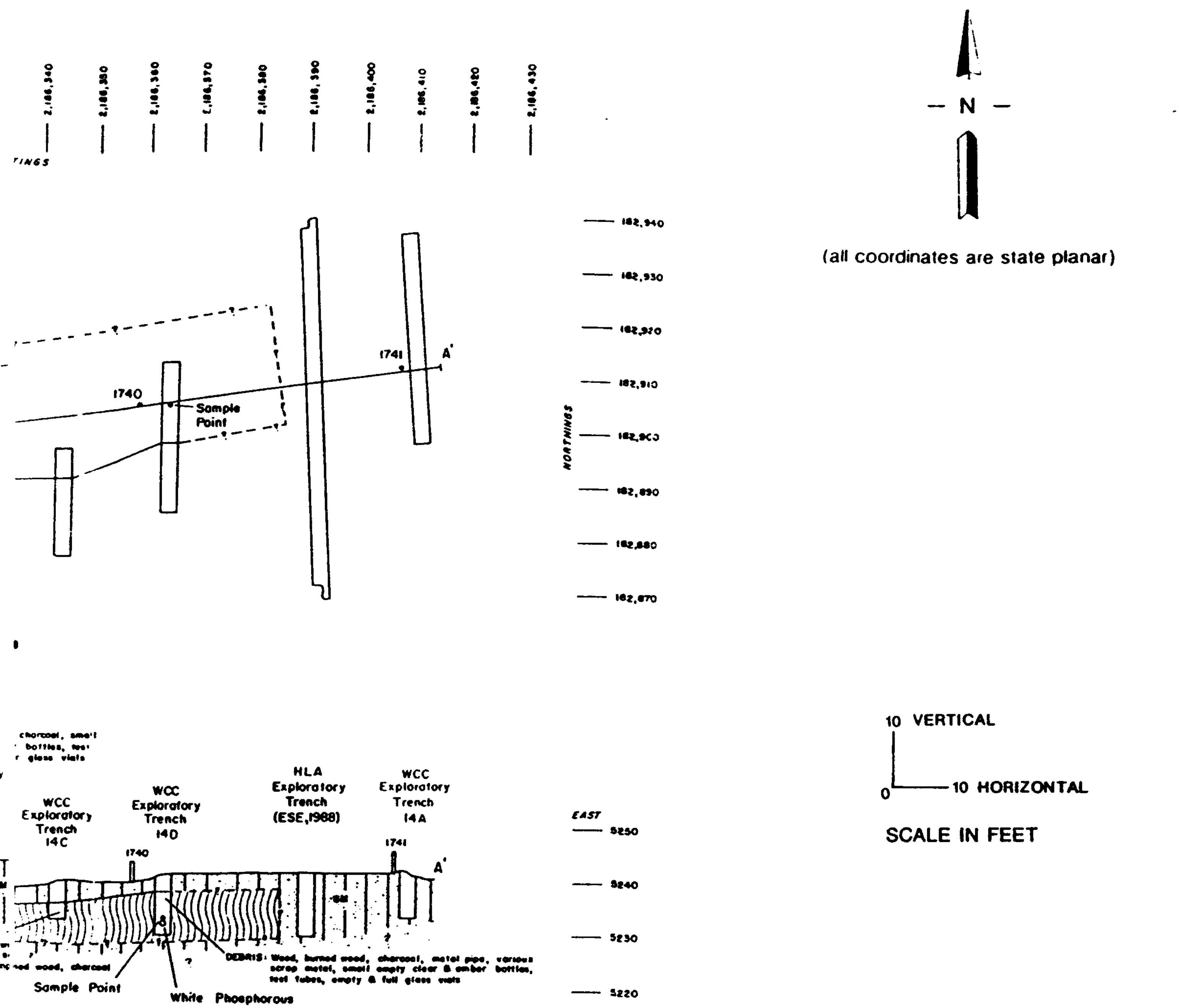
2,186,320
2,186,330
2,186,340
2,186,350
2,186,360
2,186,370
2,186,380
EASTINGS
182,940
182,930
182,920
182,910
182,900
182,890
182,880
182,870
A
1737
Sample Point
1738
1739
1740
Sample Point
Plan View
WEST
5250
5240
5230
5220
A
1737
WCC Exploratory Trench 11
DEBRIS: Various scrap metals, wire, cable, burned fuse casings, metal bars & straps, empty small amber glass bottles & clear glass vials, some green & yellow discoloration
1738
SM
SM
Sample Point
WCC Exploratory Trench 14 B
DEBRIS: Wood, burned wood, charcoal, small empty clear & amber bottles, test tubes, empty & clear glass vials
1739
WCC Exploratory Trench 14 C
1740
WCC Exploratory Trench 14 D
DEBRIS: Wood, burned wood, charcoal
Sample Point
White Phosphorous
DEBRIS: Wood,
Cross Section
LEGEND
DISPOSAL WASTE/DEBRIS
SILTY SAND
SAND/ SILT MIXTURES
WATER LEVEL AT TIME OF TRENCHING
1737 2" X 2" CENTERLINE STAKES

124835

(1)

(2)



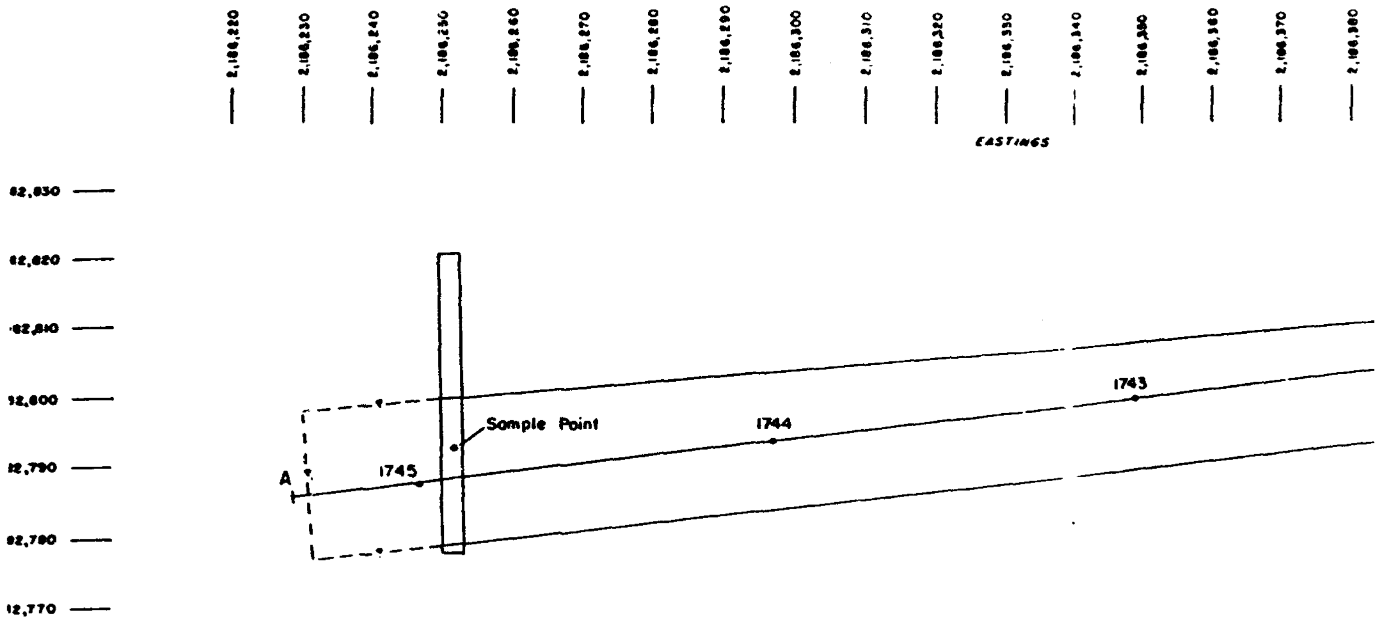
OF TRENCHING

AKES

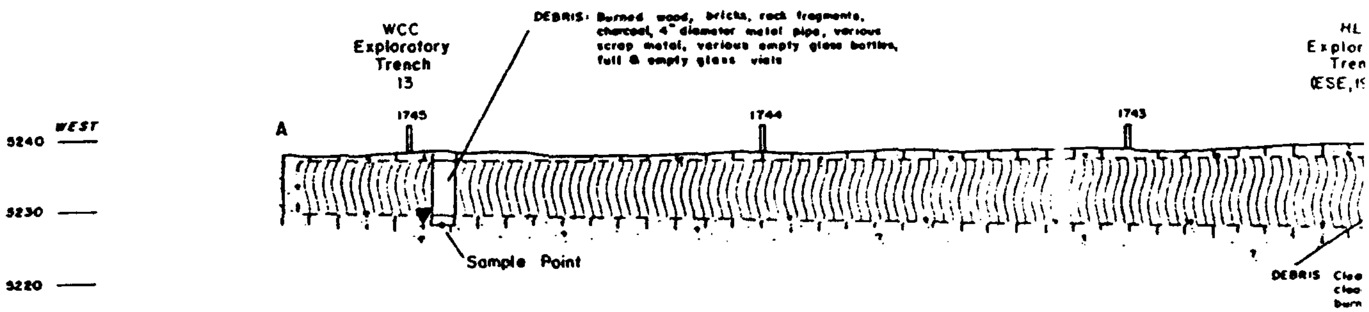
Job No. : 22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH H4/ ANOMALOUS AREA H SITE 36-17N Figure 4-11
Prepared by : S.M.	
Date : 8/16/89	

(2)

(3)



Plan View



Cross Section

LEGEND

DISPOSAL WASTE/DEBRIS

SILTY SAND
SAND/ SILT MIXTURES

▼ WATER LEVEL AT TIME OF TRENCHING

1745
● 2" X 2" CENTERLINE STAKES

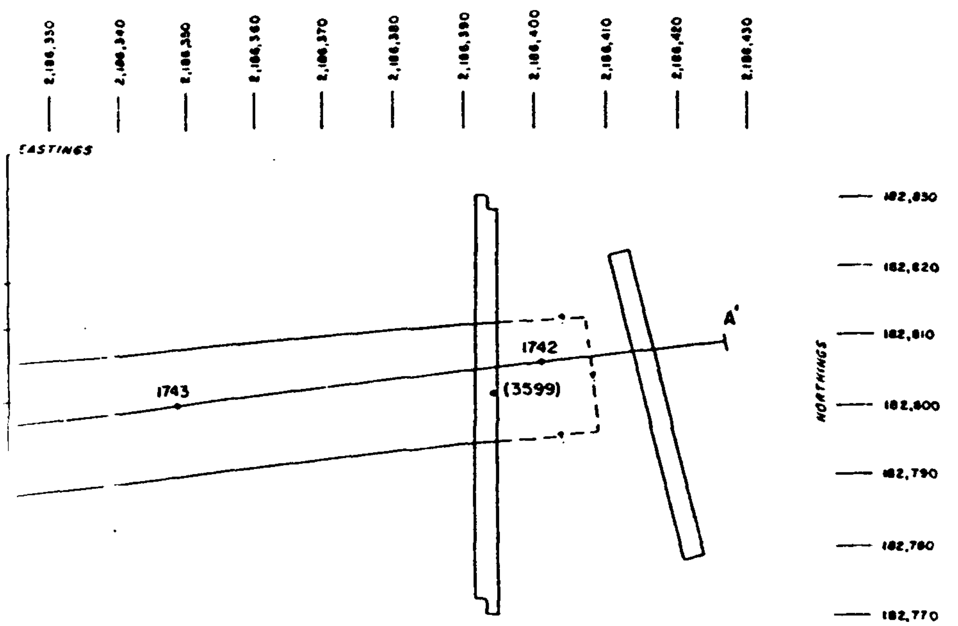
(3599) PIT BORING SAMPLE POINT (HLA 1988)

124835

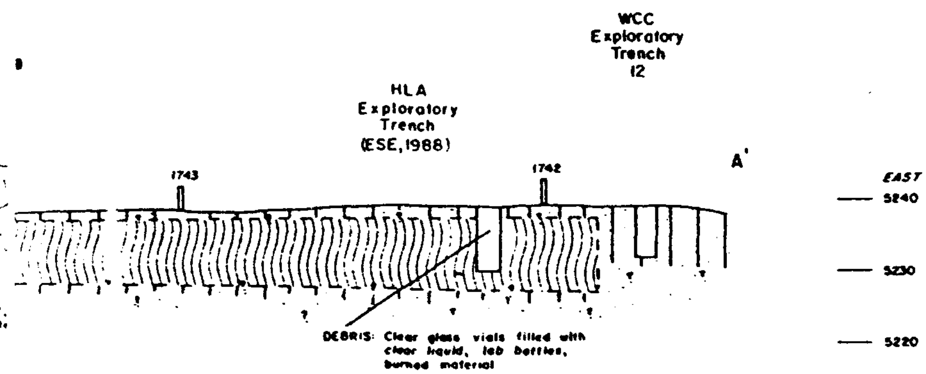
(1)

(2)

Woodward-Clyde Consultants



(all coordinates are state planar)



10 VERTICAL

0 — 10 HORIZONTAL

SCALE IN FEET

TIME OF TRENCHING

NE STAKES

Job No. :22238	PLAN VIEW & CROSS-SECTION DISPOSAL TRENCH H5/ ANOMALOUS AREA H SITE 36-17N Figure 4-12
Prepared by: S.M.	
Date: 8/16/89	

(2)

(3)

TABLE 4-5
SUMMARY OF FINDINGS IN EXPLORATORY TRENCHES IN SITE 36-17N

Exploratory Trench No.	Waste Depth (ft)	Waste Width (ft)	Exploratory Trench Depth (ft)	Disposal Trench Contents
Anomalous Area A				
1	10	14	13	Various scrap metal including wire, steel straps, burned incendiary device casings
2	3.5	13	5	Various scrap metal including wire, steel straps, burned incendiary device casings
Anomalous Area F				
3	N/A	N/A	5	Natural soil. 1/8-inch wire found near the ground surface during trenching
Anomalous Area H				
4	0.5	N/A	6	Surface burn marks. Metal rebar at 0.5 foot
5	5	23	10	Bricks, concrete rubble, fibrous pipe insulation (asbestos), various scrap metal
6	3-3.5	17	6	Bricks, concrete rubble, asphalt rubble, plastic caps, wire, rebar, 55-gallon barrel lids
7a	0.5-1.0	N/A	6	Rust-staining, crystalline sulfur on surface of site Note: Sample failed initial Army mustard screening, but cleared subsequent test
7b	7.5	24	9-10	Burned wood, charcoal, metal pipe, wire, cable, rust, rubber hoses, black and gray sludge
8a	0-0.5	?	9-10	Wood, bricks, concrete rubble (all appear to be surface-dumped)
8b	N/A	N/A	12	Natural soil
9a	2.5	17	12	Burn marks, charcoal, wire, burned fuse casings, some green and yellow discoloration on soil

TABLE 4-5
(continued)

Exploratory Trench No.	Waste Depth (ft)	Waste Width (ft)	Exploratory Trench Depth (ft)	Disposal Trench Contents
9b	> 10	12	10	Wood, burned wood, charcoal, pipes, metal straps, bars, rust staining, various metal debris, various amber and clear empty bottles
9c	> 8	N/A	8	Same as Trench No. 9b
10	3	20	6	Burn marks, various metal debris, rust staining
11	5	21	6	Scrap metal, wire, cable, metal bars, metal straps, burned fuse cases, empty amber glass bottles, clear glass vials
12	N/A	N/A	7	Natural soil
13	8.5	20	10	Burned wood, brick, rock fragments, charcoal, 4-inch diameter metal pipes, misc. scrap metal, empty and full amber and clear glass bottles, and clear glass vials
14a	4	N/A	8	Light gray powdery materi ', surface burn marks
14b	8.5	N/A	11	Wood, burned wood, charcoal, small empty clear and amber glass bottles, and full clear glass vials
14c	> 7	N/A	7	Wood, burned wood, charcoal
14d	> 11	N/A	11	Wood, burned wood, charcoal, metal pipe, scrap metal, small empty clear and amber glass bottles, and empty and full clear glass vials, white phosphorous
<u>Area West of Anomalous Area H</u>				
15	3.5	N/A	6	Large broken concrete vats, bricks, wire
16	4.5	N/A	6	Same as Trench No. 15
17	3.5	N/A	5	Burned incendiary device casings, black and gray sludge, white phosphorous
18	N/A	N/A	4	Natural soil, groundwater at 1.0 feet below ground surface

sealed with duct tape. After completing the soil borings, the PVC pipes were removed from the trenches and the holes were grouted to ground surface with a portland cement/bentonite grout mix. The centerline of disposal trench A-1 was staked by placing 2-inch by 2-inch, 4-foot long yellow wooden posts at 30-foot intervals along the axis of the trench.

The type of soil encountered in the exploratory trenches in this area was a loose, fine-grained, slightly wet, silty sand of a moderate brown (5 YR 3/4 Munsell) color. The silty sand material was encountered to a depth of about 18 feet. At about 18 feet, exploratory Trench Boring No. 1 encountered a layer of moderately yellowish-brown (10 YR 5/4 Munsell) sandy silt. At about 18.5 feet (approximately 5,231 feet above mean sea level [msl]), the borings encountered alternating thin beds (2 to 3 inches) of the silty sand and sandy silt material with the sandy silt changing color to a pale yellowish-brown (10 YR 6/2 Munsell). The sand grains were fairly well-sorted and subangular.

4.2.2.2 Anomalous Area F (Site 36-17N)

One exploratory trench was excavated in Anomalous Area F to investigate the indicated geophysical anomaly. Upon completion of the trench, no visible signs of subsurface debris or contamination were detected. For this reason, the planned boring below the trench was not installed. However, a soil sample for chemical analysis was taken from the bottom of the trench. During trench sampling, a strand of 1/8-inch-diameter fence wire was found running perpendicular to the exploratory trench just under the surface. It is probable that the wire was the source of the indicated geophysical anomaly.

The soil encountered in exploratory Trench No. 3 was a loose, fine-grained, dry silty sand of a moderate brown (5 YR 3/4 Munsell) color. The sand grains are fairly well-sorted and subangular. Some slightly harder zones were observed in the material in the trench walls and are probably attributable to [illegible]al cementation of the soil. No PVC casing was installed in this trench, and no soil boring below the trench was done, as was originally planned, due to the lack of subsurface disposal. The total trench depth was 5 feet.

4.2.2.3 Anomalous Area H (Site 36-17N)

Eighteen exploratory trenches were excavated in Anomalous Area H. Figure 4-6 shows the location of the exploratory trenches and disposal trenches investigated in Anomalous Area H. The original work plan called for 11 trenches to be excavated across the geophysical anomalies. It was necessary to dig seven additional

exploratory trenches, Nos. 7b, 8b, 9b, 9c, 14b, 14c, and 14d, to better define the anomalies indicated at those locations.

Exploratory Trench No. 4 was excavated at an indicated geophysical anomaly. Upon completion of the trench, no visible signs of subsurface debris or contamination were noted. Some piles of surface dumped material were noted at the surface. A soil sample was taken from the bottom of the trench, but a planned boring below the trench was not installed because no subsurface disposal was evident. However, some surface burn scars were noted along the trench sidewalls.

4.2.2.3.1 Disposal Trench H-1. Exploratory Trench Nos. 5 and 6 were excavated across a linear pile of building rubble visible on the surface along the northern edge of Anomalous Area H (disposal trench H-1) (Figure 4-8). Significant debris fields were encountered in both trenches. The debris consisted of various building rubble including bricks, concrete pieces, friable asbestos pipe insulation, asphalt, plastic caps, and scrap metal including 55-gallon barrel lids, wire, and rebar. The material forms a 2- to 3-foot mound along the entire length of the anomaly and extends below ground surface another 3 to 5 feet.

4.2.2.3.2 Disposal Trench H-2. Exploratory Trench Nos. 7a, 7b, 8a, and 8b were excavated to define linear anomaly H-2 in Anomalous Area H (Figure 4-9). Trench Nos. 7a and 8a were dug between the survey stakes marking the geophysical anomaly. Trench No. 7a exhibited no visible indication of contamination except for some shallow rust colored staining at a depth of approximately 0.5 to 1.0 foot. Large pieces of crystalline sulfur were observed lying on the surface surrounding the trench. A garlic-like odor was noted emanating from the trench after excavation ceased. No contamination or debris was evident in the trench, but it was sampled at a depth of approximately 6 feet. A preliminary surety agent screen of the sample indicated possible sulfur-based Army chemical agents and resulted in the analytical lab samples exceeding holding times. It was later determined that only elemental sulfur was present in the sample. However, it was necessary to collect a new sample because the initial sample had exceeded laboratory holding times.

Trench No. 7b was excavated 1 week later to locate the western end of disposal trench H-2 and to obtain another soil sample to replace the one with expired holding time. A significant debris zone was encountered consisting of burned wood, charcoal, black and gray sludge, rubber hoses, rust-colored staining and miscellaneous scrap metal, including pipes, wire, and cable.

Trench No. 8a was excavated near the east end of the indicated end of disposal trench H-2. No significant debris or waste was evident in this trench except for a thin layer of surface-dumped wood, bricks, and concrete debris along the north end of the trench. Therefore, no sample was collected.

Trench No. 8b was excavated approximately 30 feet northeast of Trench No. 8a to better define the debris encountered in Trench No. 8a. Upon completion of the trench, no debris or contamination was evident so no sample was collected. Metal debris could be seen at a depth of approximately 2 to 2.5 feet in the Environmental Science and Engineering, Inc. (ESE) exploratory trench, which is located directly west of exploratory Trench No. 8a. Apparently, this trench marks the eastern extent of disposal Trench H-2.

4.2.2.3.3 Disposal Trench H-3. Exploratory Trench No. 9a was excavated between the stakes marking ends of the anomaly indicated by the geophysical survey (disposal Trench H-3); however, no subsurface debris was encountered at this location (Figure 4-10). Exploratory Trench No. 9b was then excavated 60 feet east of Trench No. 9a, but no debris was initially encountered at this location. Then, Trench No. 9c encountered debris consisting of wood, metal, charred wood, and small empty glass bottles at a depth of 10 feet about 50 feet east of Trench No. 9b. The alignment of the subsurface debris indicated that disposal trench H-3 was lying more west to east than the anomaly indicated by geophysics. So, Trench No. 9b was extended farther north until it encountered the same type of debris as found in Trench No. 9c. Then, Trench No. 9a was extended farther north until it encountered a thin layer of debris including wire, fuse casings, charcoal, burn marks, and green and yellow staining in the soil. Due to the shallow depth of the debris, it is believed that Trench No. 9a marks the western end of disposal Trench H-3.

Exploratory Trench No. 10, excavated along the east end of disposal Trench H-3, also encountered a thin (approximately 1 foot), shallow debris field at a depth of 2 to 3 feet. The debris consisted of burned wood, wire, broken glass of unknown origin, and various pieces of scrap metal.

4.2.2.3.4 Disposal Trench H-4. Exploratory Trench Nos. 11, 14a, 14b, 14c, and 14d were excavated to investigate the ends of disposal Trench H-4 (Figure 4-11). Trench Nos. 11 and 14a were excavated between the stakes marking the geophysical anomaly. Trench No. 11 encountered a significant debris zone at a depth of approximately 5 feet. The debris consisted of various pieces of scrap metal, including wire, cable, burned fuse casings, metal bars and straps, and some small empty amber glass bottles and empty clear glass vials. Some green and yellow discoloration of the soil was also noted.

Exploratory Trench No. 14a encountered only shallow surface burn scars and a 3- to 4-foot thick zone of surface-dumped material, which consisted of a light gray powdery material resembling concrete dust. Exploratory Trench No. 14b was excavated approximately 60 to 70 feet east of exploratory Trench No. 11 to better define the eastern end of the original disposal trench. A debris field consisting of wood, burned wood, charcoal, small empty clear and amber bottles, test tubes, and empty and full clear glass vials was encountered from a depth of 4 feet to approximately 8 to 9 feet.

Exploratory Trench No. 14c was then excavated 35 to 40 feet east of Trench No. 14b. Debris including wood, burned wood, and charcoal was encountered at a depth of 4 feet. Exploratory Trench No. 14d was then excavated approximately 20 feet farther to the east. A debris field consisting of wood, burned wood, charcoal, metal pipe, various scrap metal, small empty clear and amber glass vials, test tubes, and empty and full clear glass vials was encountered starting at a depth of 3 feet. White phosphorous was encountered at a depth of approximately 9 feet. The material was immediately reburied and extinguished. A sample was taken at a point immediately above where the white phosphorous was encountered.

The HLA exploratory trench (Figure 4-12) is located approximately 15 to 20 feet east of WCC exploratory Trench No. 14d. This trench encountered no debris or waste (ESE 1988). Therefore, exploratory Trench No. 14d is apparently within 15 to 20 feet of the eastern end of disposal Trench H-4.

4.2.2.3.5 <u>Disposal Trench H-5</u>. Exploratory Trench Nos. 13 and 12 were excavated to investigate the ends of disposal Trench H-5 (Figure 4-12). Both trenches were excavated between the stakes marking the ends of the geophysical anomaly. Trench No. 13, at the west end of the anomaly, encountered a significant debris field from a depth of 0.5 to 1 foot and extending to a depth of approximately 8 feet. The debris field, located immediately above the free groundwater level, consisted of burned wood, bricks, rock fragments, 4-inch diameter metal pipes, various pieces of scrap metal, and small empty amber and clear bottles and some clear glass vials containing a clear oily liquid.

Exploratory Trench No. 12, at the east end of the anomaly, encountered no visible waste or debris. The HLA exploratory trench is located approximately 15 to 20 feet west of WCC exploratory Trench No. 12. This trench encountered debris, including laboratory bottles, clear glass vials containing an oily yellow liquid and burn material (ESE 1988). Therefore, exploratory Trench No. 12 is apparently within 15 to 20 feet of the eastern end of disposal Trench H-5.

The type of soil encountered in Anomalous Area H was primarily a loose, fine-grained, silty sand of a moderate yellowish-brown color (10 YR 5/4 Munsell) with some darker yellowish-brown (10 YR 4/2 Munsell) or a moderate brown color (5 YR 4/4 Munsell). In exploratory Trench Nos. 9a and 7, the soil type changed to a firm to stiff, low plasticity, wet sandy silty clay of a dark yellowish-brown color (10 YR 4/2 Munsell). The material ranged from dry to very wet depending on the trench location and the proximity to groundwater. The sand grains are fairly well-sorted and subangular.

4.2.2.4 Area West of Anomalous Area H (Site 36-17N)

Four additional exploratory trenches were excavated to investigate several geophysical anomalies identified along the west side of Anomalous Area H (Figure 4-6). Exploratory Trench Nos. 15 and 16 were excavated to investigate a linear anomaly indicated by the geophysical program. Both trenches were excavated between the stakes marking the ends of the geophysical anomaly. Significant debris fields, consisting of large concrete troughs and various building rubble, were found in each trench. Because of the large size of the debris, it was impractical to trench through the material. For this reason, the full depth and width of the debris field was not exposed. However, samples of the waste in the trench were collected and analyzed.

Exploratory Trench No. 18 was excavated to the north of exploratory Trench Nos. 15 and 16 to investigate a large oval-shaped anomaly indicated by the geophysics program. The initial trenching attempt encountered groundwater at a depth of approximately 1 foot, and this exploratory trench was immediately abandoned. No sample was collected at this location.

Exploratory Trench No. 17 was excavated approximately 50 feet north of Trench No. 18. This trench encountered black sludge-like material and some metal debris, including burned-out incendiary casings and white phosphorous at a depth of approximately 3 feet. The white phosphorous ignited upon exposure to air and was immediately buried and extinguished. The sludge material was screened for agents, yielding a negative response. The trench was advanced 15 feet farther north, where it encountered clean soil. No subsurface disposal trench was evident at this location so no sample was taken. The materials encountered appeared to be surface dumped from trucks into a natural depression along the edge of Basin A. The July 1945 aerial photograph supports this interpretation.

The type of soil present in all trenches west of Anomalous Area H was a loose, fine-grained, dry to saturated silty sand from a moderate yellowish-brown (10 YR 5/4 Munsell) to a moderate brown (5 YR 3/4 Munsell)

color. The sand grains were fairly well-sorted and subangular. None of the trenches was advanced deeper than approximately 6 feet due to shallow groundwater.

4.2.3 Groundwater

The groundwater investigation in Site 36-17 was designed to use existing wells to the extent possible to monitor water quality upgradient and downgradient of the disposal trenches to evaluate whether the trenches are adding contaminants to groundwater. The program included installation of 6 new monitoring wells: Nos. 36187, 36188, 36189, 36190, 36191, and 36192; and sampling of the new wells as well as 11 existing wells: Nos. 36075, 36087, 36590, 36591, 36593, 36067, 36080, 36084, 36085, 36180, and 36088. Table 4-6 is a summary of Site 36-17 well characteristics. Figure 4-13 shows the location of the wells sampled in Site 36-17 for this program.

Soil samples were collected from each of the new wells at the time of installation. Soil sampling, well purging, and sampling were performed in accordance with the QAPP, SOPs, and USATHAMA procedures. Stabilization of pH and conductivity parameters prior to sampling was within the specified ranges in the Sample Design Plan. The following sections describe the lithologies encountered at each of the newly installed wells. Boring logs, groundwater observation well reports, and a well development summary table are contained in Appendixes E, F, and I, respectively.

4.2.3.1 Well Installation

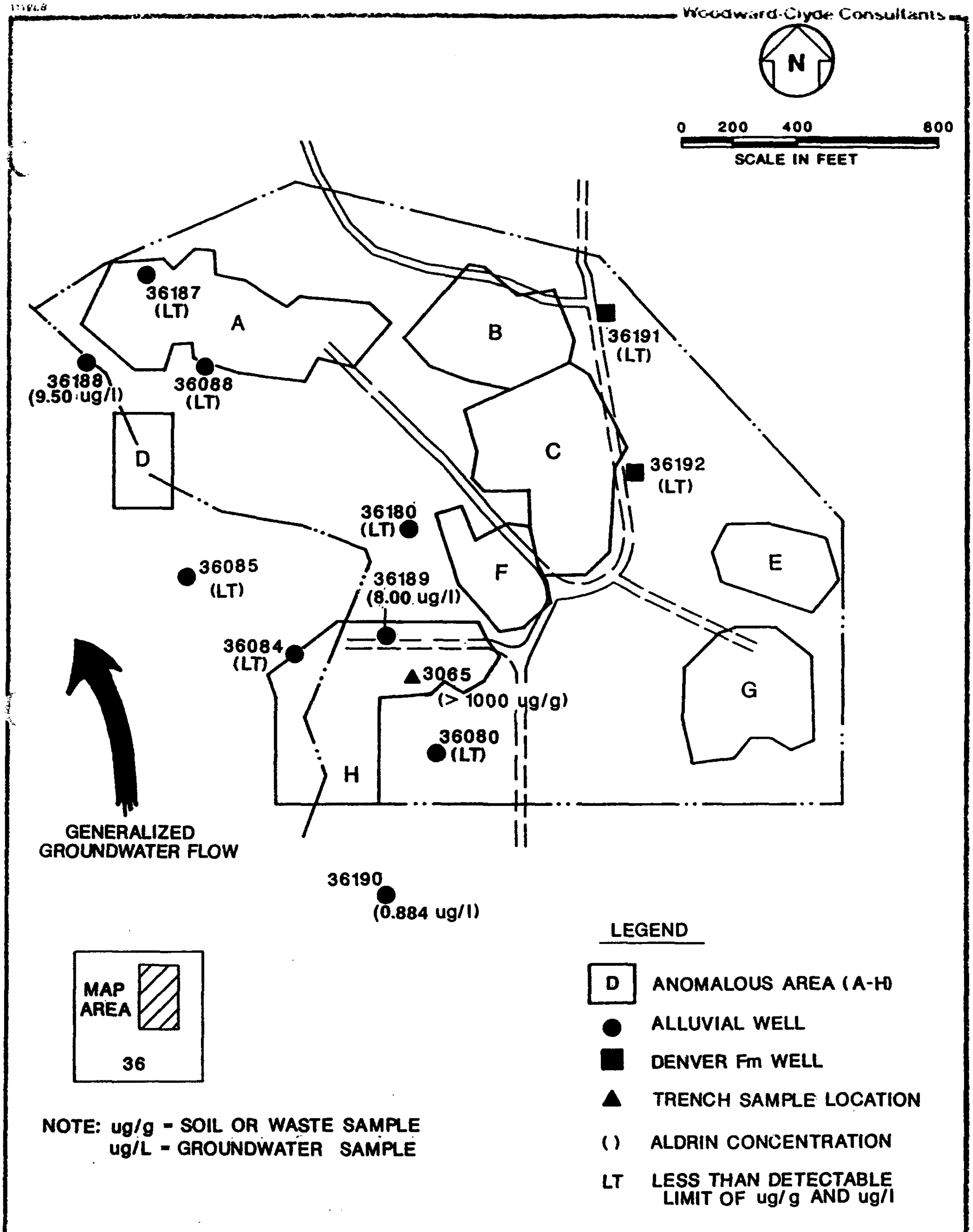
Well installations for Well Nos. 36187, 36188, 36189, 36190, 36191, and 36192 are discussed below.

4.2.3.1.1 Well No. 36187. Well No. 36187 is located downgradient of Anomalous Area A along the northwest boundary of Site 36-17N on the west flank of the prominent ridge east of Basin A. The ground level is 5,241.5 feet above msl.

The boring for Well No. 36187 encountered 0.3 foot of topsoil consisting of a brown to black sandy silt with roots. The lithology encountered from 0.3 foot to 13 feet below ground level was very uniform consisting of a yellowish-brown silty sand. There are some hard reddish-brown clay inclusions from 4 to 6.5 feet. From 13 feet (5,228.5 feet elevation) to the total depth of the hole, a very loose, saturated silty sand was encountered. Clayey silt layers were noted from 18.4 to 19 feet and again at 21.4 feet to the completion depth of 22 feet below ground level (5,219.5 feet elevation).

TABLE 4-6
GROUNDWATER WELL SUMMARY OF SITE 36-17

Well No.	Screened Interval (ft)	Formation	Water Elevation (ft)	Reason Sampled
36067	5230.8-	Alluvial	5234.3	Downgradient of pesticide pits; 5227.8 upgradient of northern portion of 36-17S
36075	5245.7- 5242.3	Alluvial	5243.9	Upgradient of Section 36-17
36080	5230.8- 5225.8	Alluvial	5243.7	Upgradient of Section 36-17 Anomaly H
36084	5228.4- 5224.4	Alluvial	5229.3	Downgradient of Section 36-17 Anomaly H
36085	5222.2- 5218.2	Alluvial	5228.5	Downgradient of Section 36-17 Anomaly H
36087	5246- 5243	Alluvial	5247.9	Upgradient of Section 36-17
36088	5223- 5219.6	Alluvial	5227.8	Downgradient of Anomaly H; upgradient of Anomaly A
36180	N/A	Alluvial	5227.9	Downgradient of Anomaly H; upgradient of Anomaly A
36187	5229.9- 5221.1	Alluvial	5227.7	Downgradient of Anomaly A
36188	5228.7- 5219.9	Alluvial	5228.3	Downgradient of Anomaly A
36189	5228.3- 5219.5	Alluvial	5228.6	Downgradient of Anomaly H; upgradient of Anomaly A
36190	5230.9- 5222.5	Alluvial	5231	Downgradient of 36-17S; upgradient of Anomaly H
36191	5220.2 5211.4	Denver	5213.3	Downgradient, NE of the bedrock ridge, from 36-17N
36192	5198.6- 5187.6	Denver	5224.1	Downgradient, NE of the bedrock ridge, from 36-17N
36590	5232.6- 5222.6	Alluvial	5224.1	Next to the pesticide pits, upgradient of the northern part of 36-17S
36591	5230.5 5220.5	Alluvial	5242.5	Upgradient of the pesticide pits
36593	5230- 5220	Alluvial	5242	Upgradient of the pesticide pits



Job No. : 22238-A	COMPLEX DISPOSAL TRENCHES-ALDRIN CONCENTRATION IN SOIL AND GROUNDWATER SAMPLES
Prepared by : D.C.C.	
Date : 11/16/89	Figure 4-13

The soil samples became damp to moist at 5.5 feet. Free water was noted in the tube at 12.25 feet. At 13 feet, free water was first noted in the hole. The well screen was set from 11.6 to 20.4 feet below ground surface (bgs) (5,229.9 to 5,221.1 feet above msl).

4.2.3.1.2 Well No. 36188. Well No. 36188 is also located downgradient of Anomaly A in the west-northwest corner of Site 36-17N, about 342 feet southwest of Well No. 36187. It is located on the east flank of the paleochannel, which underlies the low area occupied by Basin A. The elevation is 5,240.2 feet above msl.

The top soil consisted of a black sandy silt with abundant roots and organic matter to a depth 0.2 foot below ground level. Underlying the top soil is 11.3 feet of a tan to yellowish-brown silty sand. From 5.5 feet to 11.5 feet, there are clasts of reddish-brown oxidized silt and sand material. At 11.5 feet below ground level (5,228.7 feet elevation), a 1.5-foot thick layer of dark yellowish-brown clayey silt was encountered. This unit contained tan clay clasts.

At 13 feet below ground level (5,227.2 feet elevation), a clean, very fine to fine-grained, water-saturated sand layer was noted. At 18 feet below ground level, the clean sand graded to a silty sand with a trace of red clay veins and clasts. The silty sand continued to 22.1 feet bgs (5,218.1 feet elevation) where a grayish-brown clayey silt was encountered to the total depth of the boring at 23.5 feet (5,216.7 feet elevation). The top 0.3 foot of silt had a fine gravel component and there were scattered reddish-brown clay inclusions throughout the interval. This contact is interpreted to be the top of the Denver Formation. Stabilized water level was measured at 5,228.3 feet above msl. The well screen was set from 11.5 to 20.3 feet bgs (5,228.7 to 5,219.9 feet above msl).

4.2.3.1.3 Well No. 36189. Well No. 36189 is located in the southwest quadrant of Site 36-17N immediately downgradient of Anomaly H. It is also slightly east of Basin A along the northeast flank of the apparent paleochannel. The ground level elevation is 5,239.9 feet above msl.

The surface geology consists of an eolian sand to a depth of 6 inches. From 0.5 to 8.8 feet bgs, the lithology is predominantly a silty sand with occasional clayey sand. A 1.2-foot layer of silty clay occurs at 8.8 feet. Underlying the clay is a clay-like silt layer that extends to 13.5 feet bgs. A yellowish-brown, silty, clay-like gravel with occasional interbedded claystone layers was noted from 13.5 to 19.5 feet bgs. Scattered clasts of a tan silt were noted with the gravel. The clasts resemble those found in the volcaniclastic unit which locally marks the top of the Denver Formation.

At 19.5 feet bgs (5,220.4 feet elevation), an orangish-brown clay layer was encountered that extends to the total depth of the hole, 22.5 feet (5,217.4 feet elevation). The top 1 foot of the clay includes some fine gravel.

Groundwater was encountered at a depth of 10 feet bgs. This corresponds with the bottom of the upper silty clay layer. There was a trace of moisture in the clayey sand from 0.5 to 1.5 feet bgs. The well screen was set from 11.6 to 20.4 feet bgs (5,228.3 to 5,219.5 feet above msl).

4.2.3.1.4 Well No. 36190. Well No. 36190 is located approximately 250 feet upgradient of Anomaly H in the northern end of Site 36-17S, slightly east of Basin A. This well is located near the head of the buried paleochannel apparently developed on the Denver Formation. The ground level elevation at this well is 5,239.7 feet above msl (Datum 1984).

The surface lithology consisted of a 3.8-foot thick layer of tan to brown eolian sand overlying a 1.7-foot thick layer of silty clay. From 5.5 feet bgs to a total depth of 20 feet bgs, the lithology was a fairly uniform silty sand. There were some black silty inclusions from 8 to 10 feet bgs and occurring again from 12 feet bgs to total depth. At 17.4 feet bgs the color of the sand gradually changed from a yellow to yellowish-brown to an orangish-yellow to orange. Along with the color change, a fine gray gravel was noted. This is believed to be the volcaniclastic unit locally marking the top of the Denver Formation. Groundwater was encountered at 7.5 feet. After drilling was completed, the water level was measured at 6.8 feet. The well screen was set from 8.5 to 17.6 feet bgs (5,230.8 to 5,222.1 feet above msl).

4.2.3.1.5 Well No. 36191. Well No. 36191 was completed in the Denver Formation. It is located along the top of the prominent ridge in the northeast corner of Site 36-17N downgradient of Anomaly B. The ridge corresponds to a topographic high in the Denver Formation, which protrudes above the alluvial aquifer. The ground level is 5,248.3 feet above msl.

The lithology consisted of a silty sand from the surface to 16.3 feet below ground level. The top 0.2 foot of soil contained some roots. At 4 feet bgs, the sand graded from a predominantly fine grain to a very fine grain. At 13 feet bgs, hard tan clay inclusions were noted in the sand. A trace of dampness was noticed at 10 feet bgs, but no free groundwater was encountered.

The top of the Denver Formation was encountered at 16.3 feet (5,232.0 feet elevation). The contact was marked by a tan to light olive-gray clay, with reddish-brown, green, and black mineral inclusions. This

material is apparently a volcanic unit. Underlying the volcaniclastic unit is a 6.5-foot layer of sandy silt with a trace of fine gravel scattered throughout. Occasional clasts of reddish fine- to medium-grain sand and traces of roots were also noted, which suggests that this layer is a paleosoil. Underlying the silt was a 0.9-foot thick layer of very gravelly silt.

A claystone/weathered shale unit interbedded within layers of a yellowish-orange siltstone occurred from 24.6 feet bgs (5,223.7 feet elevation) to total depth of 40 feet bgs (5,208.3 above msl). Silt appears to also fill old fractures, as indicated by its vertical orientation in places.

No free groundwater was encountered while drilling the hole. The sandy silt at the top of the Denver Formation had a trace of moisture at 19 feet bgs. Twenty-four hours after drilling, the boring contained 1.8 feet of water. The hole was screened from 28.1 to 36.9 feet bgs (5,220.2 to 5,211.4 feet above msl).

4.2.3.1.6 Well No. 36192. Well No. 36192 is located downgradient of Anomaly C approximately 500 feet southeast of Well No. 36191 along the top of the ridge. The ground level is 5,253.68 feet above msl.

Top soil consisted of a black to dark brown sandy silt with roots to a depth of 0.5 foot bgs. Underlying it to 1.9 feet below ground level was a dark brown clayey silt with a trace of roots. From 1.9 to 8.6 feet bgs, a yellowish-brown silty sand was encountered.

At 8.6 feet bgs (5,245.2 feet elevation), the volcaniclastic unit was encountered, indicating the top of the Denver Formation. It was encountered to a depth of 10.1 feet bgs. Below the volcaniclastic unit, a claystone/weathered shale interbedded with a siltstone was noted from 24.5 to 27 feet bgs.

At 28 feet bgs (5,225.68 feet elevation), a very hard sandstone was encountered. Because of the hardness of the sandstone, solid flight augers were needed to advance the hole to its total depth of 65 feet bgs. Groundwater was noted at 55 feet bgs. The well was screened from 55.1 to 63.9 feet bgs (5,198.6 to 5,187.6 feet above msl).

4.2.4 Analytical Program

This section contains the findings of the chemical analytical program conducted to analyze soil, water, and waste samples collected in the Complex Disposal Trenches Area during this field program. Table 4-7 shows the results of analysis of Site 36-17 soil and waste samples. Table 4-8 shows the findings of Site 36-17

groundwater sample analysis. (Because of their length, Tables 4-7 and 4-8 have been placed at the end of Section 4.0.)

4.2.5 Data Interpretation

The sampling and analytical program developed for this investigation was designed to further characterize the waste materials in the Complex Disposal Trenches, evaluate if any of the contaminants in the trenches are entering the groundwater, and provide information to evaluate waste testability by various remedial technologies.

The investigative program developed for this site was comprised of the following elements:

- Collect and analyze previously unavailable historical aerial photographs of the site
- Review findings of previous site characterization investigations
- Perform geophysical survey to identify key disposal trenches and clear locations for borings or trenches
- Excavate exploratory trenches perpendicular to key disposal trenches to sample waste materials and delineate trench boundaries
- Install new monitoring wells upgradient and downgradient of key disposal trenches
- Sample new and existing upgradient and downgradient monitoring wells

The discussion in this section includes data collected during previous investigations conducted in the complex disposal trench area to provide additional information concerning the nature, distribution, and concentration of contaminants in this area.

4.2.5.1 Waste Characterization

Due to the complexity of the past waste disposal practices and the resulting heterogeneous nature of the waste materials in the disposal trenches, it is difficult to identify specific point sources for each of the

analytes found in this area. However, some specific analytes were found in the trenches investigated at concentrations that indicate a potential contamination source area for those analytes.

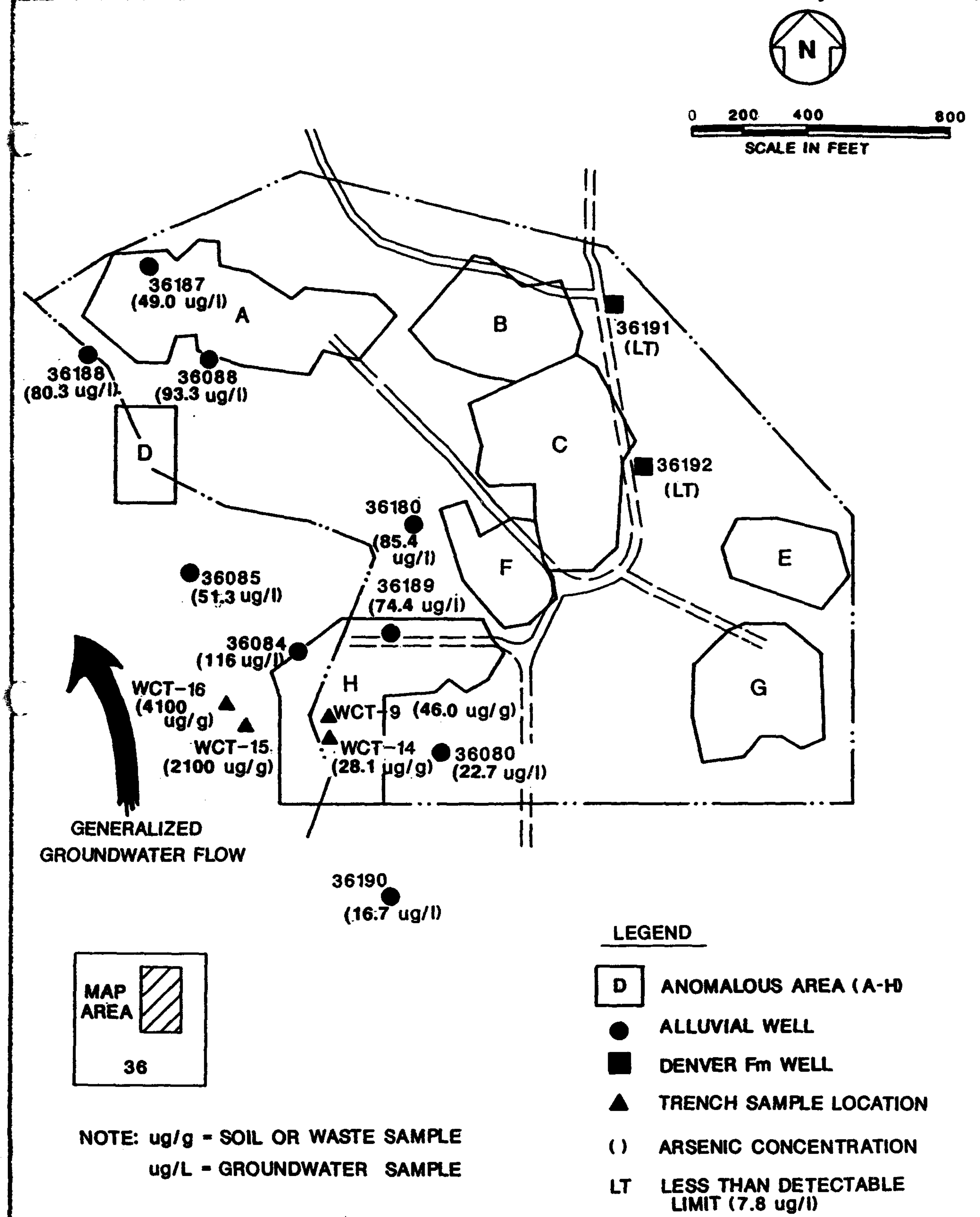
Soil samples collected from the trench areas investigated in anomalous areas A, F, and H during this program as well as previous sampling programs indicate high concentrations of the following analytes:

Analyte	Area	Highest Detected Concentration in Soil ($\mu g/g$)
Aldrin	H	>1,000
Arsenic	H	4,100
Chlordane	H	>25.0
Dieldrin	H	> 500
Dithiane	H	300
Lead	H, A	10,000
Mercury	H	800
Zinc	A	2,600

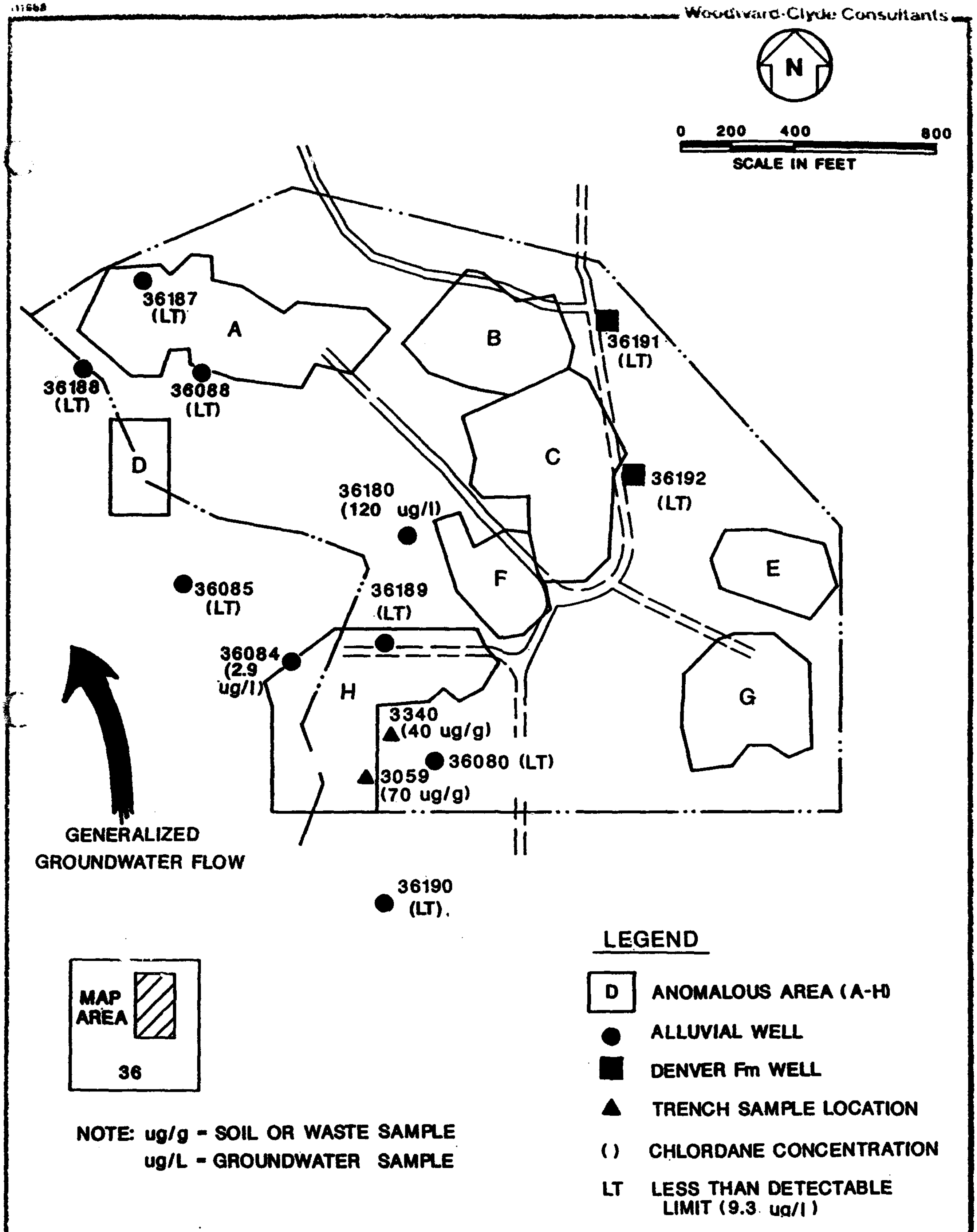
Seven of the exploratory trenches excavated in Anomalous Area H during the IRA field program intersected the groundwater table. This indicates that the contaminated material in some of the disposal trenches is probably in contact with groundwater during some seasons.

4.2.5.2 Contaminant Migration

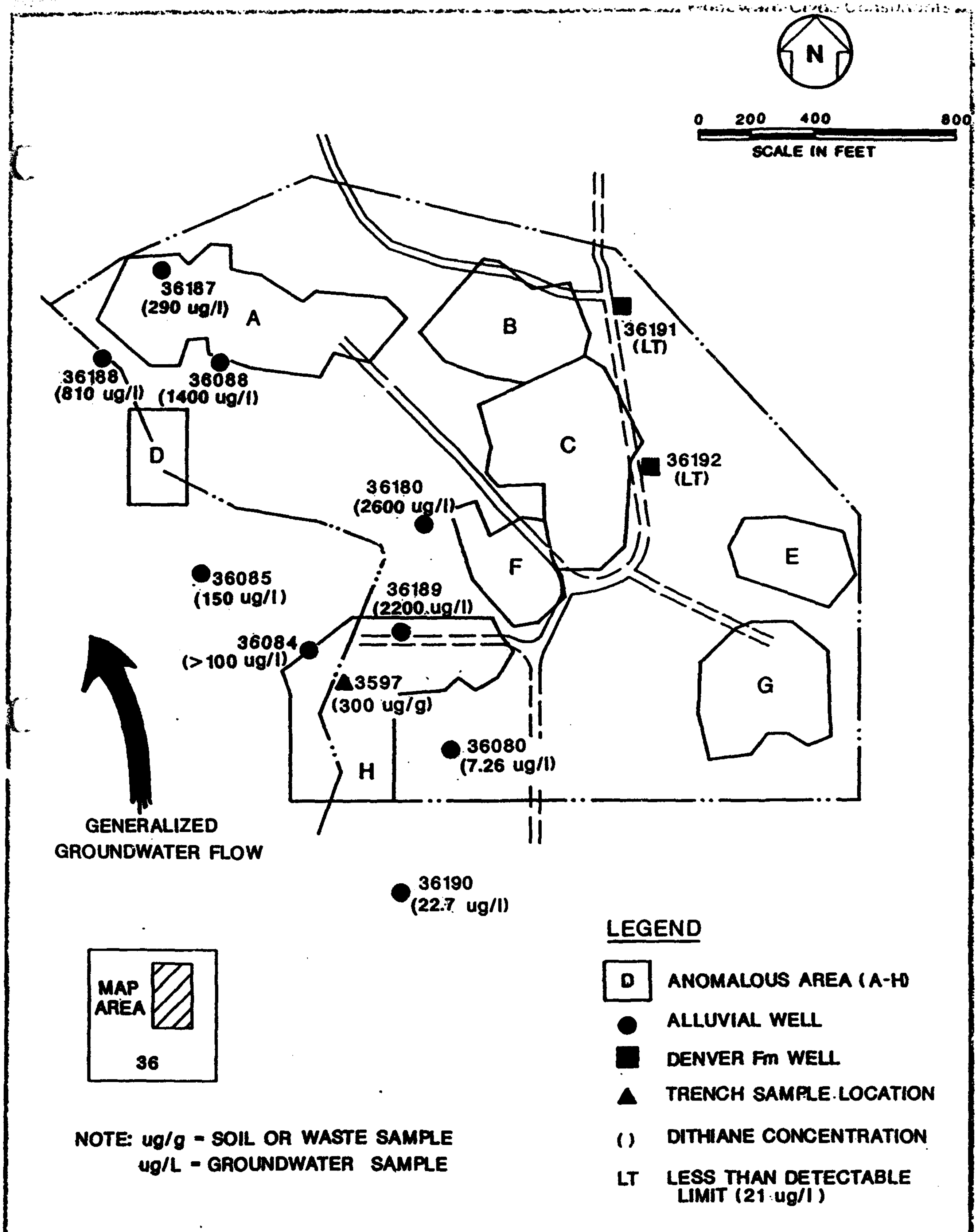
Groundwater samples taken from wells located upgradient and downgradient of disposal trench areas indicate an increase in the downgradient concentrations of heavy metals, mustard-related organo-sulfur compounds, and organochlorine pesticides. Specifically, the downgradient concentrations of aldrin, arsenic, chlordane, and dithiane are higher than upgradient concentrations. Figures 4-13 to 4-16 show the upgradient and downgradient groundwater concentration ($\mu g/L$), as well as the concentration (in $\mu g/g$) for soil/waste samples taken from disposal trenches located between the upgradient and downgradient wells for these specific analytes. The increase in downgradient analyte concentrations shown on the contaminant distribution maps indicate that those trenches are likely sources of groundwater contamination for the indicated analytes. However, an upgradient source for each of these analytes is also indicated.



Job No. : 22238-A	COMPLEX DISPOSAL TRENCHES ARSENIC CONCENTRATION IN SOIL AND GROUNDWATER SAMPLES Figure 4-14
Prepared by: D.C.C.	
Date: 11/16/89	



Job No. : 22238-A	COMPLEX DISPOSAL TRENCHES CHLORDANE CONCENTRATION IN SOIL AND GROUNDWATER SAMPLES Figure 4-15
Prepared by : D.C.C.	
Date : 11/16/89	



Job No. :2223[illegible]-A	COMPLEX DISPOSAL TRENCHES DITHIANE CONCENTRATION IN SOIL AND GROUNDWATER SAMPLES Figure 4-16
Prepared by: D.C.C.	
Date: 11/16/89	

4.3 LIME SETTLING BASINS

Previous investigations conducted in the Lime Settling Basins indicated high concentrations of arsenic and organochlorine pesticides in soils. However, insufficient groundwater data were available to evaluate whether the Lime Settling Basins were a source of groundwater contamination.

The investigative program for this site included installation of a new well downgradient of the Lime Settling Basins, sampling groundwater from four downgradient wells, including soil and water from the new well and four upgradient wells, including one well installed during the investigation of the M-1 Settling Basins, and performing a chemical fixation treatability test on Lime Settling Basins soils.

The following sections describe the field investigations and present the results of the treatability test and chemical analysis of the soil and groundwater samples collected in the Lime Settling Basins area during the field program.

4.3.1 Soils

The investigation in the Lime Settling Basins area included the installation of Well No. 36194 about 85 feet downgradient of the basins. Well No. 36193, installed during the investigation of the M-1 Basins, is located about 300 feet upgradient of the Lime Settling Basins and provides some current stratigraphic control in the area. Both wells were drilled to the Denver Formation bedrock.

Well No. 36194, drilled to a total depth of 28 feet, encountered bedrock at 26.5 feet. The surface elevation of Well No. 36194 is 5,254.3 feet above msl. The alluvium consists of yellowish-brown, loose, fine-grained, well-sorted, subangular, silty sand to 19 feet; a moderate brown silty sand to 21.6 feet; and a firm to stiff, pale yellowish-brown clay to 26.5 feet. The Denver Formation, encountered at 26.5 feet, was a very stiff, dusky brown, silty clay. The well screen was set from 5,240.1 to 5,231.3 feet above msl.

Well No. 36193, drilled to a total depth of 19 feet, encountered the top of the Denver Formation bedrock at 15.5 feet. The surface elevation of Well No. 36193 is 5,261.8 feet above msl. The alluvial material consisted of yellowish-brown, loose, fine-grained, well-sorted, subangular, silty sand. The top 3 feet of the Denver Formation consisted of fine-grained silty sand interbedded with 2- to 3-inch thick pale orange silty clay lenses. At 18.5 feet, the Denver Formation changed to a hard, dark brown claystone. The well screen was set from 6.9 to 15.7 feet bgs (5,254.9 to 5,246.1 feet above msl).

Six soil samples were taken during the installation of Well Nos. 36193 and 36194. Samples taken from the 0.5- to 1-foot and 10- to 11-foot intervals in Well No. 36193 were analyzed for GC/MS semivolatiles, arsenic, and mercury. The sample taken from the 4- to 5-foot interval was analyzed for GC/MS volatiles, GC/MS semivolatiles, organochlorine pesticides, organosulfur compounds, thiodiglycol, DIMP/DMMP, arsenic, mercury, ICP metals, and moisture content. Samples taken from the 0- to 1-foot, 4- to 5-foot, and 19- to 20-foot intervals in Well No. 36194 were analyzed for GC/MS volatiles, GC/MS semivolatiles, organochlorine pesticides, organosulfur compounds, thiodiglycol, DIMP/DMMP, total arsenic and mercury, dissolved arsenic and mercury, ICP metals, and moisture content.

4.3.2 Groundwater

Water samples were collected from eight wells in the Lime Settling Basins area. The sampled wells include Nos. 36001, 36054, 36055, 36058, 36076, 36167, 36193, and 36194. The samples were analyzed for GC/MS volatiles, GC/MS semivolatiles, organochlorine pesticides, organosulfur compounds, thiodiglycol, DIMP/DMMP, total arsenic and mercury, dissolved arsenic and mercury, ICP metals, and pH.

Four of the wells are located upgradient and four are downgradient of the Lime Settling Basins as shown in Figure 4-3. Screened intervals for all the wells sampled, except Well No. 36055, are in the alluvial aquifer or are straddling the *Alluvium/Denver Formation contact*. The screened interval in Well No. 36055 is set in the Denver Formation just below the contact. It was believed that the 5 feet of sand pack above the screened interval (required by USATHAMA) would allow direct communication with the alluvial aquifer. However, water level and the major anions and cations measured in the well are significantly different from nearby Lime Settling Basins wells suggesting that it is not screened in the same unit. Table 4-9 is a summary of the Lime Settling Basins well characteristics. Please note that Well Nos. 36001 and 36193 are described in Table 4-1, M-1 Basins Well Summary, as well as Table 4-9.

The water table measurements were taken in all of the Lime Settling Basins wells in July 1989. The water table elevations range from 5,253 feet above msl south of the Lime Settling Basins to 5,239 feet above msl to the north. Based on the observed measurements, groundwater flow is towards the north to northwest in the Lime Settling Basins area. The saturated thickness of the alluvium ranges from 5.4 to 18.4 feet.

4.3.3 Treatability Testing

Samples of Lime Settling Basins soil were collected for treatability testing of chemical fixation to immobilize metals and organochlorine pesticides (OCP). Previous sampling had shown high OCPs at the sample location selected for soil collection. However, the first soil sample collected failed screening for lewisite and could not be sent off post. Three additional soil samples were collected and two of the three also failed screening for lewisite. The third sample passed the Army agent screen and was sent to Kiber Associates for chemical fixation treatability testing. The soil sample was analyzed by EPA TCLP protocols before and after chemical fixation. Table 4-10 shows the results of the chemical fixation treatability testing.

4.3.4 Analytical Program

The results of the analytical program are presented in this section.

4.3.4.1 Chemical Data

Table 4-11 shows the findings of Lime Basins Soil Sample Analyses. Table 4-12 shows the findings of Lime Basins groundwater analyses. (Because of their length, Tables 4-11 and 4-12 have been placed at the end of Section 4.0.)

4.3.5 Data Interpretation

This section contains a discussion of the data collected at the Section 36 Lime Settling Basins during the field and laboratory investigative program conducted to assess IRA alternatives. The sampling and analytical program developed for this investigation was designed to investigate upgradient and downgradient alluvial groundwater samples. The purpose of this investigation was to evaluate if any of the contaminants identified during previous sampling programs had entered the groundwater, and, if so, to assess appropriate remedial technologies to mitigate the release of contaminants. This section also includes a discussion of data collected during previous investigations conducted at the Lime Settling Basins to provide additional information characterizing the nature, concentration, and distribution of contaminants in this area.

TABLE 4-9
GROUNDWATER WELL SUMMARY TABLE FOR LIME SETTLING BASINS

Well No.	Screened Interval (ft)	Formation	Water Elevation (ft)	Reason Sampled
36001	5253.8-5243.3	Alluvial	5251.7	Downgradient of M-1 Settling Basins; upgradient of Lime Settling Basins
36054	5243.1-5239.1	Alluvial	5251.5	Upgradient of Lime Settling Basins
36055	5228.3-5224.3	Denver	5244.2	Downgradient of Lime Settling Basins
36058	5236.6-5233.2	Alluvial	5253.2	Upgradient of Lime Settling Basins
36076	5234.8-5231.4	Alluvial	5239.4	Downgradient of Lime Settling Basins
36167	5243.1-5237.3	Alluvial	5243.6	Downgradient of Lime Settling Basins
36193	5254.9-5246.1	Alluvial	5252.8	Downgradient of M-1 Settling Basins; upgradient of Lime Settling Basins
36194	5240.1-5231.3	Alluvial	5240.8	Downgradient of Lime Settling Basins

TABLE 4-10
CHEMICAL FIXATION TREATABILITY TEST RESULTS
LIME SETTLING BASINS
(Page 1 of 3)

Analyte	Before	Limit of Detection (ug/L)	After
Method 6010 ICP Metals			
Aluminum	ND	200	ND
Antimony	ND	200	ND
Arsenic	ND	300	ND
Barium	1,300 ug/L	50	1,400
Beryllium	ND	5	ND
Boron	ND	500	NA
Cadmium	ND	5	ND
Calcium	2,400,000 ug/L	5,000	2,900,000
Chromium	ND	10	ND
Cobalt	ND	50	ND
Copper	ND	20	ND
Iron	ND	100	ND
Lead	ND	100	ND
Magnesium	ND	5,000	ND
Manganese	ND	20	ND
Molybdenum	ND	100	ND
Nickel	ND	50	ND
Potassium	31,000	5,000	ND
Selenium	ND	300	ND
Silver	ND	10	ND
Sodium	29,000	5,000	16,000
Thallium	ND	500	ND
Vanadium	ND	50	ND
Zinc	ND	20	ND
Method 7060 EPA			
Arsenic	ND	5	ND
Method 7470 EPA			
Mercury	.7	.2	ND

TABLE 4-10
CHEMICAL FIXATION TREATABILITY TEST RESULTS
LIME SETTLING BASINS
(Page 2 of 3)

Method EPA 8080 OCP/PCB+USATHAMA ADDITIONAL OCP COMPOUNDS

Analyte	Before	Limit of Detection (ug/L)	After
Dimethyldisulfide	ND	.55	ND
1,4-Oxathiane	ND	2.38	ND
1,4-Dithiane	ND	1.34	ND
p-Chlorophenyl-methylsulfide	ND	5.69	ND
p-Chlorophenyl-methylsulfoxide	ND	11.51	ND
p-Chlorophenyl-methylsulfone	ND	7.46	ND
Benzothiazole	ND	5.0	ND
pp-DDT	ND	.05	ND
Dieldrin	2	.05	ND
Endosulfur I	.03	.02	ND
Endosulfur II	ND	.02	ND
Endosulfur Sulfate	ND	.02	ND
Endrin	ND	.05	ND
Endrin Aldehyde	ND	.02	ND
Heptachlor	ND	.01	ND
Heptachlor	ND	.01	ND
Epoxide	ND	1	ND
Toxaphene			

TABLE 4-10
CHEMICAL FIXATION TREATABILITY TEST RESULTS
LIME SETTLING BASINS
(Page 3 of 3)

Method EPA 8080 OCP/PCB+USATHAMA ADDITIONAL OCP COMPOUNDS

Analyte	Before	Limit of Detection (ug/L)	After
Aroclor 1016	ND	.5	ND
Aroclor 1212	ND	.5	ND
Aroclor 1232	ND	.5	ND
Aroclor 1242	ND	.5	ND
Aroclor 1248	ND	.5	ND
Aroclor 1254	ND	.5	ND
Aroclor 1260	ND	.5	ND
Methoxychlor	ND	.01	ND
Isodrin	ND	.05	ND
Hexachlorocyclo-pentadiene (HCCPD)	ND	.05	ND
Aldrin	ND	05	ND
alpha-BHC	ND	.01	ND
beta-BHC	ND	.01	ND
delta-BHC	.02	.01	ND
Lindane	ND	.01	ND
Chlordane	ND	.1	ND
pp-DDD	ND	.01	ND
pp-DDE	ND	.05	ND

4.3.5.1 Waste Characterization

Based on the operational history and soil sample analysis, the primary contaminants of concern at this site were identified as arsenic and OCPs. Soil samples collected from within and around the perimeter of the Lime Settling Basins during previous investigations indicate high concentrations of the following analytes:

Analyte	Highest Detected Concentration in Soil (µg/g)
Aldrin	600
Arsenic	370
Chlordane	100
Dieldrin	400
Endrin	200
Isodrin	300

A construction drawing of the Lime Settling Basins shows the bottom of the basins at an elevation of 5,241.9 feet above msl. Water level measurements taken in July 1989 indicate that the elevation of the bottom of the basins is approximately 5 feet below the groundwater table in the area.

4.3.5.2 Contaminant Migration

The distribution of the above listed analytes within the Lime Settling Basins differ from the distribution found in surrounding soils. Within the basins, high concentrations of analytes are generally found throughout the soil fill and the underlying lime percolation bed material to the bottom of the basins (shown on the construction drawing at elevation 5,241.9 feet above msl). However, analysis of the distribution of analytes in soils surrounding the Lime Settling Basins indicates a different trend.

In the soils surrounding the Lime Settling Basins, the concentration and number of detections of OCPs is higher in the shallow surficial soils (generally less than 3 feet) than in deeper soil horizons. The concentration of OCPs in soil horizons greater than 5 feet below ground surface (bgs) are generally below the certified reportable limit (CRL) for the compounds.

Analysis of the distribution of arsenic in soils surrounding the Lime Settling Basins and particularly downgradient of the basins indicate a notable trend. Low concentrations of arsenic are generally found in most surficial soils within, adjacent to, and downgradient of the Lime Settling Basins. The concentration

of arsenic in deeper soil horizons (but above the water table) are generally below the CRL (with a few exceptions). However, the concentration of arsenic in soil below the water table (or within the zone of annual water level fluctuations) in downgradient borings ranged from 79 to 340 $\mu g/g$. This increase in arsenic concentration in soil below the water table downgradient of the Lime Settling Basins indicates that the basins have been releasing arsenic to the alluvial groundwater and that arsenic is now adsorbed onto soil particles downgradient of the Lime Settling Basins.

Figure 4-3 shows the concentration of arsenic detected in groundwater in Lime Settling Basins wells during the IRA field investigations. The two to three order of magnitude increases in arsenic concentration in filtered (less than 0.45 micron). Alluvial groundwater samples collected downgradient of the Lime Settling Basins indicates that arsenic is continuing to enter groundwater in a mobile form.

4.4 MOTOR POOL AREA

Previous investigations indicate that a portion of a trichloroethylene (TCE) plume detected in the Western Study Area groundwater may originate in the area. However, the data collected were insufficient to identify a source for the TCE groundwater contamination.

The investigative program developed for this site included a soil gas survey and a records and plans search focused on the buildings near the previously indicated TCE plume.

4.4.1 Soil Gas Survey

The soil gas survey was conducted in the vicinity of the Motor Pool Area to evaluate the nature and extent of volatile organic compounds (VOC) present in the soil. The major compound of interest was TCE because it was identified during a previous soil gas investigation in the area.

Eighty soil gas samples, located at approximately 200-foot centers, were collected at the site. Within the area shown by previous investigations to be contaminated, sample spacing was reduced to provide more detailed information on the distribution of contaminants. At the start of the program, three vertical profiles were done to determine optimum sampling depth and vertical distribution of contaminants. Vertical profile sampling depths were 5, 10, and 15 feet bgs. As a result, the standard sampling depth for this program was 15 bgs.

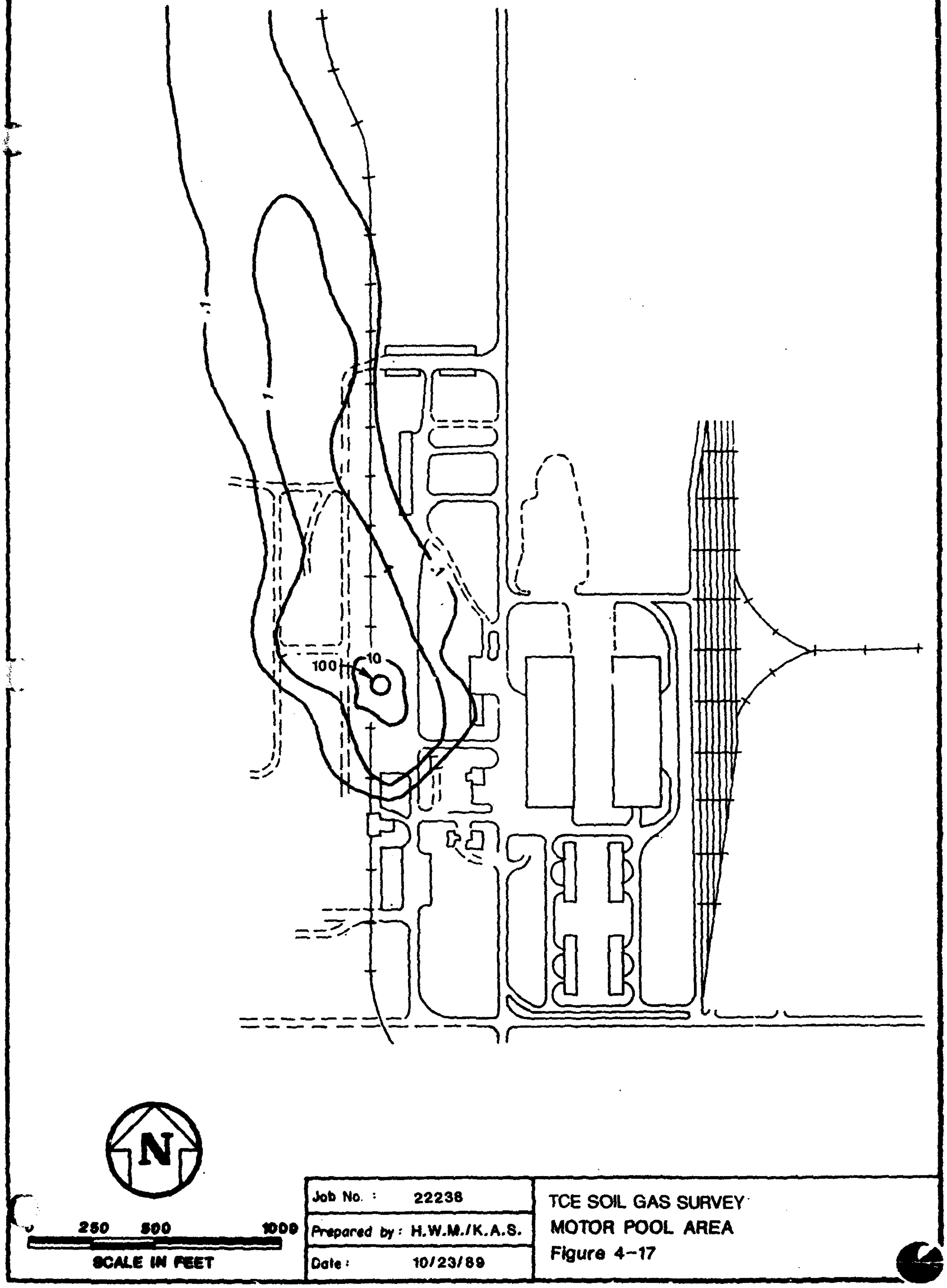
The program was designed to analyze soil gas samples for VOCs, including TCE, trans-1, 2-dichloroethene, cis 1, 2 dichloroethene, 1,1 dichloroethene, as well as benzene, ethylbenzene, toluene, meta + para xylenes, and ortho xylene. Analyses for the full 502.2 suite of compounds were performed at selected random locations to determine if these additional compounds were present. Appendix J contains the soil gas sampling results.

4.4.2 Data Interpretation

Concentrations of analytes in the soil gas samples were found to range from < 0.01 to > 600 (as gas). A complete list of analytes and their respective concentrations at each location are shown in Appendix J. The areal distribution of TCE soil gas concentrations in the Motor Pool Area is shown in Figure 4-17. This distribution closely resembles the distribution mapped by the previous study.

The results of this soil gas survey indicate that the highest concentrations of TCE were noted in an area behind Building 624 near where a pipe from a floor drain in the building was found to discharge into a ditch. The floor drain pipe originates in Building 624, a building where historical records indicate TURCO® (a TCE-based solvent) was used to clean and degrease equipment and machinery.

The TCE soil gas plume originating where the pipe discharges could be traced approximately 2,500 feet north from Building 624 using the soil gas sampling equipment. The lack of available information concerning the quantities of TCE used and the timing of the discharges makes interpretation of the rate of migration difficult; however, at least one apparent source of the previously identified TCE soil gas plume was identified during the investigation.



Job No. : 22238	TCE SOIL GAS SURVEY
Prepared by : H.W.M./K.A.S.	MOTOR POOL AREA
Date : 10/23/89	Figure 4-17

SAMPLE IDENTIFICATION

Each sample shall be given a unique, sequential sample identification number. These numbers will be assigned to each sample prior to the sampling event. The format of the number is as follows: WCXXX999-Y887. The format is broken into eight sections as follows:

- The first two characters, WC, identify the sample to the laboratory as a Woodward-Clyde sample.

- The next three characters, shown as XXX in the example number, identify the site. The choices for XXX are: M-1, 36N, and 36S.

- The next three digits, shown as 999 in the example number, are the boring or well number. Boring numbers will be assigned sequentially, beginning with 001, 002, 003, etc. except for any boring that will be converted to a monitoring well. The three-digit boring number for borings converted to monitoring wells will consist of the last three digits of the well number which has been assigned by the Army, shown on Figure C-3.

- The first character following the hyphen, shown as a Y in the example number, identifies the sample matrix. Sample matrix codes are:

  G - Ground water
  S - Soil in alluvium
  D - Soil in Denver Formation
  W - Waste in M-1 Settling Basins or in Section 36 trenches
  A - Air

- The next two digits, shown as 88 in the example number, give an approximate depth of the sample, e.g. 04 for a sample taken at the 4- to 5-ft depth interval. Exact depth shall be recorded in the field book and entered into the data base. This number is primarily to provide a means of differentiating samples taken from the same boring.

- The final digit, shown as 7 in the example number, is a code for identifying the type of sample. The codes are:

1 - Sample
2 - Duplicate
3 - Field Rinsates
4 - Trip Blanks
5 - Field Blanks
6 - Filter Rinsate Blank

Tables 4-3 And 4-4

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F&G	Mercury	F&G	ICP Metals
---------- Field number - WC330021	Site ID - 01083		Site type - WASS	Sample Date - 89130 (Julian)								
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 7.6000		HG LT 0.0500		N.A.
---------- Field number - WC330041	Site ID - 01083		Site type - WASS	Sample Date - 89131 (Julian)								
N.A.	N.A.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4000 DMDS LT 3.1200 OXAT LT 1.7400	ALDRN LT 0.0019 CL6CP LT 0.0018 CLDAN LT 0.0230 DLDRN LT 0.0033 ENDRN LT 0.0058 ISODR LT 0.0011 PPDDE LT 0.0024 PPDDT LT 0.0020	N.A.	DIMP LT 0.1140 DMMP LT 0.1330	CLC2A LT 35.5000 TDGCL LT 4.2000	N.A.	AS 4.4100		HG LT 0.0500		CD LT 0.7400 CR 12.4000 CU 19.7000 PB LT 8.4000 ZN 68.4000
---------- Field number - WC330071	Site ID - 01083		Site type - WASS	Sample Date - 89130 (Julian)								
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 4.9900		HG LT 0.0500		N.A.

****

Volatiles	Semi-volatiles	OSCS	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F&G	Mercury	F&G	ICP Metals
---------- Field number - WC935001	Site ID - 36193		Site type - BORE	Sample Date - 89136 (Julian)								
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 7.6900		HG 0.1600		N.A.
---------- Field number - WC935041	Site ID - 36193		Site type - BORE	Sample Date - 89136 (Julian)								
L.T.	L.T.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4500 DMDS LT 3.1200 OXAT LT 1.7400	ALDRN LT 0.0019 CL6CP LT 0.0018 CLDAN LT 0.0230 DLDRN LT 0.0033 ENDRN LT 0.0058 ISODR LT 0.0011 PPDDE LT 0.0024 PPDDT LT 0.0020	N.A.	DIMP LT 0.1140 DMMP LT 0.1330	CLC2A LT 35.5000 TDGCL LT 4.2000	N.A.	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400 CR 10.3000 CU 8.3600 PB 11.6000 ZN 40.5000
---------- Field number - WC935121	Site ID - 36193		Site type - BORE	Sample Date - 89136 (Julian)								
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 13.0000		HG LT 0.0500		N.A.

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

---------- Field number - WCSW001 Site ID - M-11SWWASS Site type - WASS Sample Date - 89129 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F a g	Mercury	F a g	ICP metals
L.T.	124TCB LT 0.0400	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 34000.0000		HG 4000.0000		CD 1000.0000
	12DCLB LT 0.1100	CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000						CR LT 6.5000
	12DPH ND 0.1400	CPMSO2 LT 9.0100	CLDAN LT 0.0230									CU 11.1000
	12EPCH 0.1470	DITH LT 1.4500	ENDRN LT 0.0058									PB LT 8.4000
	13DCLB LT 0.1300	DMDS LT 3.1200	ISODR LT 0.0011									ZN LT 8.7000
	14DCLB LT 0.0980	OXAT LT 1.7400	PPDDE LT 0.0024									
	245TCP LT 0.1000		PPDDT LT 0.0020									
	246TCP LT 0.1700											
	24DCLP LT 0.1800											
	24DMPN LT 0.6900											
	24DNP LT 1.2000											
	24DNT LT 0.1400											
	26DNT LT 0.0850											
	2CLP LT 0.0600											
	2CNAP LT 0.0360											
	2MNAP LT 0.0490											
	2MP LT 0.0290											
	2NANIL LT 0.0620											
	2NP LT 0.1400											
	33DCBD ND 6.3000											
	3NANIL LT 0.4500											
	46DN2C ND 0.5500											
	4BRPPE ND 0.0330											
	4CANIL LT 0.8100											
	4CL3C LT 0.0950											
	4CLPPE LT 0.0330											
	4MP LT 0.2400											
	4NANIL LT 0.4100											
	4NP LT 1.4000											
	ABHC ND 0.2700											
	ACHLOR ND 0.3300											
	AENSLF ND 0.6200											
	ALDRN LT 0.3000											
	ALDRN ND 0.3300											
	ANAPNE LT 0.0360											
	ANAPYL LT 0.0330											
	ANTRC ND 0.0330											
	ATZ LT 0.3000											
	B2CEXM LT 0.0590											
	B2CIPE LT 0.2000											
	B2CLEE LT 0.0330											

.able 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles			OBCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
WCSV0001 (Cont'd)														
	B2EHP	ND	0.6200											
	BAANTR	ND	0.1700											
	BAPYR	ND	0.2500											
	BBFANT	ND	0.2100											
	BBHC	ND	0.2700											
	BBZP	ND	0.1700											
	BENSLF	ND	0.6200											
	BENZID	ND	0.8000											
	BENZOA	ND	6.1000											
	BGHIPY	ND	0.2500											
	BKFANT	ND	0.0660											
	BZALC	LT	0.1900											
	C13		0.1470											
	C14		0.2930											
	C15		0.2930											
	C16		0.2930											
	C17		0.2930											
	CHRY	ND	0.1200											
	CL6BZ	ND	0.0330											
	CL6CP	LT	0.6000											
	CL6CP	LT	6.2000											
	CL6ET	LT	0.1500											
	CLDAN	LT	2.0000											
	CPMS	LT	0.9000											
	CPMSO	LT	0.3000											
	CPMSO2	LT	0.3000											
	DBAHA	ND	0.2100											
	DBCP	LT	0.3000											
	DBHC	ND	0.2700											
	DBZFUR	LT	0.0350											
	DCPD	LT	1.0000											
	DDVP	LT	3.0000											
	DEP	LT	0.2400											
	DIMP	LT	1.0000											
	DITH	LT	0.4000											
	DLDRN	LT	0.3000											
	DLDRN	ND	0.3100											
	DMP	LT	0.1700											
	DNBP	ND	0.0610											
	DNOP	ND	0.1900											
	ENDRN	LT	0.5000											
	ENDRN	ND	0.4500											
	ENDRNA	ND	0.5300											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP metals
	WCSV0001 (cont'd)											
	ENDRNK ND 0.5300											
	ESFSO4 ND 0.6200											
	FANT ND 0.0680											
	FLRENE LT 0.0330											
	GCHLOR ND 0.3300											
	HCBD LT 0.2300											
	HPCL ND 0.1300											
	HPCLE ND 0.3300											
	ICDPYR ND 0.2900											
	ISODR LT 0.3000											
	ISOPHR LT 0.0330											
	LIN ND 0.2700											
	MEXCLR ND 0.3300											
	MLTHN LT 0.7000											
	NAP LT 0.0370											
	NB LT 0.0450											
	NNDMEA ND 0.1400											
	NNDNPA LT 0.2000											
	NNDPA ND 0.1900											
	OXAT LT 0.3000											
	PCB016 ND 1.4000											
	PCB221 ND 1.4000											
	PCB232 ND 1.4000											
	PCB242 ND 1.4000											
	PCB248 ND 2.0000											
	PCB254 ND 2.3000											
	PCB260 ND 2.6000											
	PCP ND 1.3000											
	PHANTR ND 0.0330											
	PHENOL LT 0.1100											
	PPDDD ND 0.3000											
	PPDDE LT 0.6000											
	PPDDE ND 0.3100											
	PPDDT LT 0.5000											
	PPDDT ND 0.3100											
	PRTHN LT 0.9000											
	PYR ND 0.0330											
	SUPONA LT 0.6000											
	TXPHEN ND 2.6000											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
N-1 Settling Basin
(RMADMS Database)

---------- Field number - WCSVSA01 Site ID - N-1_SOIL-A Site type - CMPH Sample Date - 89129 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
L.T.	124TCB LT 0.0400	BTZ LT 2.0400	CL6CP LT 0.0018	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 200.0000		HG 32.0000		CD 5.4900
	12DCLB LT 0.1100	CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000						CR 19.3000
	12DPH ND 0.1400	CPMSO2 LT 9.0100										CU 12.1000
	13DCLB LT 0.1300	DITH LT 1.4500										PB 11.6000
	14DCLB LT 0.0980	DMDS LT 3.1200										ZN 56.3000
	245TCP LT 0.1000	OXAT LT 1.7400										
	246TCP LT 0.1700											
	24DCLP LT 0.1800											
	24DMPN LT 0.6900											
	24DNP LT 1.2000											
	24DNT LT 0.1400											
	26DNT LT 0.0850											
	2CLP LT 0.0600											
	2CNAP LT 0.0360											
	2MNAP LT 0.0490											
	2MP LT 0.0290											
	2NANIL LT 0.0620											
	2NP LT 0.1400											
	33DCBD ND 6.3000											
	3NANIL LT 0.4500											
	46DN2C ND 0.5500											
	4BRPPE ND 0.0330											
	4CANIL LT 0.8100											
	4CL3C LT 0.0950											
	4CLPPE LT 0.0330											
	4MP LT 0.2400											
	4NANIL LT 0.4100											
	4NP LT 1.4000											
	ABHC ND 0.2700											
	ACHLOR ND 0.3300											
	AENSLF ND 0.6200											
	ALDRN LT 0.3000											
	ALDRN ND 0.3300											
	ANAPNE LT 0.0360											
	ANAPYL LT 0.0330											
	ANTRC ND 0.0330											
	ATZ LT 0.3000											
	B2CEXM LT 0.0590											
	B2CIPE LT 0.2000											
	B2CLEE LT 0.0330											
	B2EHP ND 0.6200											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
	WCSVSA01 (Cont'd)											
	BAANTR ND 0.1700											
	BAPYR ND 0.2500											
	BBFANT ND 0.2100											
	BBHC ND 0.2700											
	BBZP ND 0.1700											
	BENSLF ND 0.6200											
	BENZID ND 0.8500											
	BENZOA ND 6.1000											
	BGHIPY ND 0.2500											
	BKFANT ND 0.0660											
	BZALC LT 0.1900											
	CHRY ND 0.1200											
	CL6BZ ND 0.1300											
	CL6CP LT 0.6000											
	CL6CP LT 6.2000											
	CL6ET LT 0.1500											
	CLDAN LT 2.0000											
	CPMS LT 0.9000											
	CPMSO LT 0.3000											
	CPMSO2 LT 0.3000											
	DBAHA ND 0.2100											
	DBCP LT 0.3000											
	DBHC ND 0.2700											
	DBZFUR LT 0.0350											
	DCPD LT 1.0000											
	DDVP LT 3.0000											
	DEP LT 0.2400											
	DIMP LT 1.0000											
	DITH LT 0.4000											
	DLDRN LT 0.3000											
	DLDRN ND 0.3100											
	DMP LT 0.1700											
	DNBP ND 0.0610											
	DNOP ND 0.1900											
	ENDRN LT 0.5000											
	ENDRN ND 0.4500											
	ENDRNA ND 0.5300											
	ENDRNK ND 0.5300											
	ESFSO4 ND 0.6200											
	FANT ND 0.0680											
	FLRENE LT 0.0330											
	GCHLOR ND 0.3300											
	HCBD LT 0.2300											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
	WCSVSA01 (cont'd)											
	HPCL ND 0.1300											
	HPCLE ND 0.3300											
	ICDPYR ND 0.2900											
	ISODR LT 0.3000											
	ISOPHR LT 0.0330											
	LIN ND 0.2700											
	MEXCLR ND 0.3300											
	MLTHN LT 0.7000											
	NAP LT 0.0370											
	NB LT 0.0450											
	NNDMEA ND 0.1400											
	NNDNPA LT 0.2000											
	NNDPA ND 0.1900											
	OXAT LT 0.3000											
	PCB016 ND 1.4000											
	PCB221 ND 1.4000											
	PCB232 ND 1.4000											
	PCB242 ND 1.4000											
	PCB248 ND 2.0000											
	PCB254 ND 2.3000											
	PCB260 ND 2.6000											
	PCP ND 1.3000											
	PHANTR ND 0.0330											
	PHENOL LT 0.1100											
	PPDDD ND 0.3000											
	PPDDE LT 0.6000											
	PPDDE ND 0.3100											
	PPDDT LT 0.5000											
	PPDDT ND 0.3100											
	PRTHN LT 0.9000											
	PYR ND 0.0330											
	SUPONA LT 0.6000											
	TXPHEN ND 2.6000											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
N-1 Settling Basin
(RMADMS Database)

---------- Field number - WCSVS801 Site ID - N-1_SOIL-B Site type - CMPH Sample Date - 89129 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Mercury	ICP Metals
111TCE LT 0.4300	124TCB LT 0.0400	BTZ LT 2.0400	DLDRN LT 0.0033	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 160.0000	HG 25.0000	CD 13.6000
112TCE LT 0.3900	12DCLB LT 0.1100	CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000				CR 21.9000
11DCLE LT 1.7000	12DPH ND 0.1400	CPMSO2 LT 9.0100								CU 13.6000
12DCE LT 1.7000	12EPCH 0.1120	DITH LT 1.4500								PB 20.4000
12DCLE LT 0.5600	13DCLB LT 0.1300	DMDS LT 3.1200								ZN 73.2000
13DMB LT 0.7400	14DCLB LT 0.0980	OXAT LT 1.7400								
BCHPD LT 0.3600	245TCP LT 0.1000									
C6H6 LT 0.2500	246TCP LT 0.1700									
CCL4 LT 0.2500	24DCLP LT 0.1800									
CH2CL2 LT 1.5000	24DMPN LT 0.6900									
CHCL3 LT 0.2900	24DNP LT 1.2000									
CLC6H5 LT 1.5000	24DNT LT 0.1400									
DBCP LT 2.4000	26DNT LT 0.0850									
DCPD 0.8160	2CLP LT 0.0600									
DMDS LT 20.0000	2CNAP LT 0.0360									
ETC6H5 LT 0.3800	2MNAP LT 0.0490									
MEC6H5 LT 0.2500	2MP LT 0.0290									
MIBK LT 0.7300	2NANIL LT 0.0620									
TCLEE LT 0.2500	2NP LT 0.1400									
TRCLE LT 0.5400	33DCBD ND 6.3000									
XYLEN LT 4.9000	3NANIL LT 0.4500									
	46DN2C ND 0.5500									
	4BRPPE ND 0.0330									
	4CANIL LT 0.8100									
	4CL3C LT 0.0950									
	4CLPPE LT 0.0330									
	4MP LT 0.2400									
	4NANIL LT 0.4100									
	4NP LT 1.4000									
	ABHC ND 0.2700									
	ACHLOR ND 0.3300									
	AENSLF ND 0.6200									
	ALDRN LT 0.3000									
	ALDRN ND 0.3300									
	ANAPNE LT 0.0360									
	ANAPYL LT 0.0330									
	ANTRC ND 0.0330									
	ATZ LT 0.3000									
	B2CEXM LT 0.0590									
	B2CIPE LT 0.2000									
	B2CLEE LT 0.0330									

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
	WCSVSB01 (Cont'd)											
	B2EHP ND 0.6200											
	BAANTR ND 0.1700											
	BAPYR ND 0.2500											
	BBFANT ND 0.2100											
	BBHC ND 0.2700											
	BBZP ND 0.1700											
	BENSLF ND 0.6200											
	BENZID ND 0.8500											
	BENZOA ND 6.1000											
	BGHIPY ND 0.2500											
	BKFANT ND 0.0660											
	BZALC LT 0.1900											
	CHRY ND 0.1200											
	CL6BZ ND 0.1200											
	CL6CP LT 0.6000											
	CL6CP LT 6.2000											
	CL6ET LT 0.1500											
	CLDAN LT 2.0000											
	CPMS LT 0.9000											
	CPMSO LT 0.3000											
	CPMSO2 LT 0.3000											
	DBAHA ND 0.2100											
	DBCP LT 0.3000											
	DBHC ND 0.2700											
	DBZFUR LT 0.0350											
	DCPD LT 1.0000											
	DDVP LT 3.0000											
	DEP LT 0.2400											
	DIMP LT 1.0000											
	DITH LT 0.4000											
	DLDRN LT 0.3000											
	DLDRN ND 0.3100											
	DMP LT 0.1700											
	DNBP ND 0.0610											
	DNOP ND 0.1900											
	ENDRN LT 0.5000											
	ENDRN ND 0.4500											
	ENDRNA ND 0.5300											
	ENDRNK ND 0.5300											
	ESFSO4 ND 0.6200											
	FANT ND 0.0680											
	FLRENE LT 0.0330											
	GCHLOR ND 0.3300											

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-Volatiles			OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
	WCSVS801 (cont'd)													
	HCBD	LT	0.2300											
	HPCL	ND	0.1300											
	HPCLE	ND	0.3300											
	ICDPYR	ND	0.2900											
	ISODR		0.4120											
	ISOPHR	LT	0.0330											
	LIN	ND	0.2700											
	MEXCLR	ND	0.3300											
	MLTHN	LT	0.7000											
	NAP	LT	0.0370											
	NB	LT	0.0450											
	NNDMEA	ND	0.1400											
	NNDNPA	LT	0.2000											
	NNDPA	ND	0.1900											
	OXAT	LT	0.3000											
	PCB016	ND	1.4000											
	PCB221	ND	1.4000											
	PCB232	ND	1.4000											
	PCB242	ND	1.4000											
	PCB248	ND	2.0000											
	PCB254	ND	2.3000											
	PCB260	ND	2.6000											
	PCP	ND	1.3000											
	PHANTR	ND	0.0330											
	PHENOL	LT	0.1100											
	PPDDD	ND	0.3000											
	PPDDE	LT	0.6000											
	PPDDE	ND	0.3100											
	PPDDT	LT	0.5000											
	PPDDT	ND	0.3100											
	PRTHN	LT	0.9000											
	PYR	ND	0.0330											
	SUPONA	LT	0.6000											
	TXPHEN	ND	2.6000											

---------- Field number - WC015001 Site ID - M1BORE001 Site type - BORE Sample Date - 89144 (julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic		Mercury		ICP Metals
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS	310.0000	HG	0.0546	N.A.

Table 4-3
Concentrations of Target Analytes
In IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP metals
---------- Field number - WC01S021	Site ID - M1BORE001	Site type - BORE	Sample Date - 89144 (julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000		HG LT 0.0500		N.A.
---------- Field number - WC01S041	Site ID - M1BORE001	Site type - BORE	Sample Date - 89144 (julian)									
111TCE LT 0.4300	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A 49.7000	N.A.	AS LT 2.5000		HG LT 0.0500		CD 1.3600
112TCE LT 0.3900		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000						CR 27.6000
11DCLE LT 1.7000		CPMSO LT 4.8100	CLDAN LT 0.0230									CU 23.3000
12DCE LT 1.7000		CPMSO2 LT 9.0100	DLDRN LT 0.0033									PB LT 8.4000
12DCLE LT 0.5600		DITH LT 1.4500	ENDRN LT 0.0058									ZN 116.0000
13DNB LT 0.7400		DMDS LT 3.1200	ISODR LT 0.0011									
BCHPD 0.5270		OXAT LT 1.7400	PPDDE LT 0.0024									
C6H6 LT 0.2500			PPDDT LT 0.0020									
CCL4 LT 0.2500												
CH2CL2 LT 1.5000												
CHCL3 LT 0.2900												
CLC6H5 LT 1.5000												
DBCP LT 2.4000												
DCPD LT 0.6400												
DMDS LT 20.0000												
ETC6H5 LT 0.3800												
MEC6H5 LT 0.2500												
MIBK LT 0.7300												
TCLEE LT 0.2500												
TRCLE LT 0.5400												
XYLEN LT 4.9000												
---------- Field number - WC01S071	Site ID - M1BORE001	Site type - BORE	Sample Date - 89144 (julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000		HG LT 0.0500		N.A.
---------- Field number - WC02S001	Site ID - M1BORE002	Site type - BORE	Sample Date - 89159 (julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 2.9900		HG 0.0630		N.A.
---------- Field number - WC02S021	Site ID - M1BORE002	Site type - BORE	Sample Date - 89159 (julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000		HG LT 0.0500		N.A.

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
N-1 Settling Basin
(RMADHS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F & G	Mercury	F & G	ICP metals
---------- Field number - WC02S041	Site ID - N1BORE002	Site type - BORE	Sample Date - 89159 (Julian)									
L.T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDCCL LT 4.2000						CR 30.4000
		CPMSO LT 4.8100	CLDAN LT 0.0230									CU 16.2000
		CPMSO2 LT 9.0100	DLDRN LT 0.0033									PB LT 8.4000
		DITH LT 1.4500	ENDRN LT 0.0058									ZN 70.3000
		DMDS LT 3.1300	ISODR LT 0.0011									
		OXAT LT 1.7400	PPDDE LT 0.0024									
			PPDDT LT 0.0020									
---------- Field number - WC02S071	Site ID - N1BORE002	Site type - BORE	Sample Date - 89159 (Julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 21.0000		HG 0.1210		N.A.
---------- Field number - WC03S021	Site ID - N1BORE003	Site type - BORE	Sample Date - 89150 (Julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000		HG LT 0.0500		N.A.
---------- Field number - WC03S041	Site ID - N1BORE003	Site type - BORE	Sample Date - 89150 (Julian)									
L.T.	L.T.	N.A.	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
			CL6CP LT 0.0018		DMMP LT 0.1330	TDCCL LT 4.2000						CR 22.1000
			CLDAN LT 0.0230									CU 13.8000
			DLDRN LT 0.0033									PB LT 8.4000
			ENDRN LT 0.0058									ZN 70.0000
			ISODR LT 0.0011									
			PPDDE LT 0.0024									
			PPDDT LT 0.0020									
---------- Field number - WC03S071	Site ID - N1BORE003	Site type - BORE	Sample Date - 89150 (Julian)									
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 110.0000		HG 0.1590		N.A.

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
N-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F & G	Mercury	F & G	ICP Metals
---------- Field number - WC045021 Site ID - M1BORE004 Site type - BORE Sample Date - 89150 (julian)												
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000		HG LT 0.0500		N.A.
---------- Field number - WC045041 Site ID - M1BORE004 Site type - BORE Sample Date - 89150 (julian)												
L.T.	L.T.	N.A.	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
			CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000						CR 15.8000
			CLDAN LT 0.0230									CU 10.3800
			DLDRN LT 0.0033									PB LT 6.4000
			ENDRN LT 0.0058									ZN 47.0000
			ISODR LT 0.0011									
			PPDDE LT 0.0024									
			PPDDT LT 0.0020									
---------- Field number - WC045071 Site ID - M1BORE004 Site type - BORE Sample Date - 89150 (julian)												
N.A.	ALDRN LT 0.3000	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 41.0000		HG 0.0961		N.A.
	ATZ LT 0.3000											
	CL6CP LT 0.6000											
	CLDAN LT 2.0000											
	CPMS LT 0.9000											
	CPMSO LT 0.3000											
	CPMSO2 LT 0.3000											
	DBCP LT 0.3000											
	DCPD 2.9900											
	DDVP LT 3.0000											
	DIMP LT 1.0000											
	DITH LT 0.4000											
	DLDRN LT 0.3000											
	ENDRN LT 0.5000											
	ISODR LT 0.3000											
	MLTHN LT 0.7000											
	OXAT LT 0.3000											
	PPDDE LT 0.6000											
	PPDDT LT 0.5000											
	PRTHN LT 0.9000											
	SUPONA LT 0.6000											

Table 4-3
Concentrations of Target Analytes
In IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	Mercury	ICP Metals
---------- Field number - WCDSS001 Site ID - M1BORE005 Site type - BORE Sample Date - 89145 (julian)										
N.A.	ALDRN 0.9680	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 57.0000	HG 4.8000	N.A.
	ATZ LT 0.3000									
	CL6CP LT 0.6000									
	CLDAN LT 2.0000									
	CPMS LT 0.9000									
	CPMSO LT 0.3000									
	CPMSO2 LT 0.3000									
	DBCP LT 0.3000									
	DCPD LT 1.0000									
	DDVP LT 3.0000									
	DIMP LT 1.0000									
	DITH LT 0.4000									
	DLDRN 7.6000									
	ENDRN 1.6000									
	ISODR LT 0.3000									
	MLTHN LT 0.7000									
	OXAT LT 0.3000									
	PPDDE 1.3900									
	PPDDT 2.8500									
	PRTHN LT 0.9000									
	SUPONA LT 0.6000									
---------- Field number - WCDSS021 Site ID - M1BORE005 Site type - BORE Sample Date - 89145 (julian)										
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 3.1800	HG LT 0.0500	N.A.
---------- Field number - WCDSS041 Site ID - M1BORE005 Site type - BORE Sample Date - 89145 (julian)										
L.T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A 45.4000	N.A.	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL 5.0100				CR 14.8000
		CPMSO LT 4.8100	CLDAN LT 0.0230							CU 10.5000
		CPMSO2 LT 9.0100	DLDRN LT 0.0033							PB 10.7000
		DITH LT 1.4500	ENDRN LT 0.0058							ZN 51.0000
		DMDS LT 3.1200	ISODR LT 0.0011							
		OXAT LT 1.7400	PPDDE LT 0.0024							
			PPDDT LT 0.0020							
---------- Field number - WCDSS071 Site ID - M1BORE005 Site type - BORE Sample Date - 89145 (julian)										
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 3.3600	HG LT 0.0500	N.A.

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADMS Database)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	F a g Mercury	F a g ICP metals
---------- Field number - WC06D191 Site ID - M1BORE006 Site type - BORE Sample Date - 89143 (julian)										
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.5000	HG LT 0.0500	N.A.
---------- Field number - WC06S071 Site ID - M1BORE006 Site type - BORE Sample Date - 89143 (julian)										
N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 4.6100	HG 3.2000	N.A.
---------- Field number - WC06W041 Site ID - M1BORE006 Site type - BORE Sample Date - 89143 (julian)										
111TCE LT 0.4300	ALDRN LT 0.3000	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 12000.0000	HG 850.0000	CD 910.0000
112TCE LT 0.3900	ATZ LT 0.3000	CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000				CR LT 6.3000
11DCLE LT 1.7000	CL6CP LT 0.6000	CPMSO2 LT 9.0100	CLDAN LT 0.0230							CU LT 4.7000
12DCE LT 1.7000	CLDAN LT 2.0000	DITH LT 1.4500	DLDRN LT 0.0033							PB 148.0000
12DCLE LT 0.5600	CPMS LT 0.9000	DMDS LT 3.1200	ENDRN LT 0.0058							ZN 28.4000
13DMB LT 0.7400	CPMSO LT 0.3000	OXAT LT 1.7400	ISODR LT 0.0011							
BCHPD 1.7700	CPMSO2 LT 0.3000		PPDDE LT 0.0024							
C6H6 LT 0.2300	DBCP LT 0.3000		PPDDT LT 0.0020							
CCL4 LT 0.2800	DCPD 12.0000									
CH2CL2 LT 1.5000	DDVP LT 3.0000									
CHCL3 LT 0.2100	DIMP LT 1.0000									
CLC6H5 LT 1.5000	DITH LT 0.4000									
DBCP LT 2.4000	DLDRN LT 0.3000									
DCPD 2.2400	ENDRN LT 0.5000									
DMDS LT 20.0000	ISODR LT 0.3000									
ETC6H5 LT 0.3600	MLTHN LT 0.7000									
MEC6H5 LT 0.2500	OXAT LT 0.3000									
MIBK LT 0.7300	PPDDE LT 0.6000									
TCLEE LT 0.2500	PPDDT LT 0.5000									
TRCLE LT 0.5400	PRTHN LT 0.9000									
XYLEN LT 4.9000	SUPONA LT 0.6000									

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
N-1 Settling Basin
(RMADHS Database)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
---------- Field Number - WC07S071 Site ID - N1BORE007 Site Type - BORE Sample Date - 89142 (Julian)												
N.A.	ALDRN LT 0.3000 ATZ LT 0.3000 CL6CP LT 0.6000 CLDAN LT 2.0000 CPMS LT 0.9000 CPMSO LT 0.3000 CPMSO2 LT 0.3000 DBCP LT 0.3000 DCPD 9.0900 DDVP LT 3.0000 DIMP LT 1.0000 DITH LT 0.4000 DLDRN LT 0.3000 ENDRN LT 0.5000 ISODR LT 0.3000 MLTHN LT 0.7000 OXAT LT 0.3000 PPDDE LT 0.6000 PPDDT LT 0.5000 PRTHN LT 0.9000 SUPONA LT 0.6000	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 1100.0000		HG 110.0000		N.A.
---------- Field Number - WC07W041 Site ID - N1BORE007 Site Type - BORE Sample Date - 89142 (Julian)												
L.T.	L.T.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4500 DMDS LT 3.1200 OXAT LT 1.7400	ALDRN LT 0.0019 CL6CP LT 0.0018 CLDAN LT 0.0230 DLDRN LT 0.0033 ENDRN LT 0.0056 ISODR LT 0.0011 PPDDE LT 0.0024 PPDDT LT 0.0020	N.A.	DIMP LT 0.1140 DMMP LT 0.1330	CLC2A LT 35.5000 TDGCL LT 4.2000	N.A.	AS 14000.0000		HG 930.0000		CD 950.0000 CR LT 6.5000 CU LT 4.7000 PB 32.9000 ZN LT 8.7000

Table 4-3
Concentrations of Target Analytes
in IRA Sampling of Soil and Waste
at
M-1 Settling Basin
(RMADHS Database)

--------- Field number - WC08W041 Site ID - M1BORE008 Site type - BORE Sample Date - 89145 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP metals
L.T.	L.T.	N.A.	CL6CP LT 0.0018	N.A.	DIMP LT 0.1140	CLC2A 50.5000	N.A.	AS 350.0000		HG 4.7000		CD 14.5000
			CLDAN LT 0.0230		DMMP LT 0.1330	TDGCL LT 4.2000						CR 25.1000
			ENDRN LT 0.0058									CU 79.4000
			ISODR LT 0.0011									PB LT 8.4000
			PPDDE LT 0.0024									ZN 80.8000
			PPDDT LT 0.0020									

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement -> Site type (WELL - UGL) and (BORE, WASS, CMPH - UGG)
GT - greater than ND - Not detected F - indicates filtered sample analysis

Table 4-4
Concentrations of Target Analytes
in IRA Ground Water Sampling
at
M-1 Settling Basin
(RMADMS Database)

atiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCNs	IMPA/MPA	Arsenic	F/Q	Mercury	F/Q	ICP Metals
------ Field number - WC77C001	Site ID - 01077		Site type - WELL	Sample Date - 89153 (julian)								
.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.3500		HG LT 0.1000	F	N.A.
								AS LT 2.3500	F	HG LT 0.1000		
------- Field number - WC83C001	Site ID - 01083		Site type - WELL	Sample Date - 89164 (julian)								
A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 7.3400		HG LT 5.0000	F	N.A.
								AS 6.5300	F	HG 0.1320		
------- Field number - WC03C001	Site ID - 01503		Site type - WELL	Sample Date - 89153 (julian)								
.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 8900.0000		HG LT 0.1000	F	N.A.
								AS 8800.0000	F	HG LT 0.1000		
--------- Field number - WC04C001	Site ID - 01504		Site type - WELL	Sample Date - 89151 (julian)								
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 20000.0000		HG 17000.0000		N.A.
								AS 13000.0000	F	HG 17000.0000	F	
---------- Field number - WC24C001	Site ID - 01524		Site type - WELL	Sample Date - 89145 (julian)								
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 3.0900	F	HG LT 0.1000		N.A.
								AS 10.6000		HG LT 0.1000	F	

Table 4-4
Concentrations of Target Analytes
in IRA Ground Water Sampling
at
M-1 Settling Basin
(RMADMS Database)

------- Field number - WC010001 Site ID - 36001 Site type - WELL Sample Date - 89158 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F Mercury	F ICP Metals
1TCE LT 500.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.2350	N.A.	DIMP LT 0.3920	TDGCL LT 6.6900	N.A.	AS LT 2.3500	HG 1.4900 F	CA 130000.000
2TCE LT 500.0000	245TCP LT 2.8000	CPMS GT 50.0000	CL6CP 0.8990					AS LT 2.3500	HG 1.7200	CD LT 8.4000
DCE LT 500.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950					AS 19.1000	HG 1.9000	CR 55.9000
DCLE LT 500.0000	24DCLP LT 8.4000	CPMSO2 GT 100.0000	DLDRN LT 0.5000					AS 2.6400 F	HG 2.5000 F	CU 34.1000
)DCE LT 2500.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN 3.2000							K 13000.0000
)DCLE 2310.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.3130							MG 46000.0000
)DCLP LT 500.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540							NA 290000.000
3DCLB LT 500.0000	2MP LT 3.6000		PPDDT LT 0.0490							PB LT 74.0000
3DCP LT 2400.0000	2NP LT 8.2000									ZN 285.0000
30MB LT 500.0000	4CL3C LT 8.5000									
CLEVE LT 1750.0000	4MP LT 2.8000									
CET LT 4000.0000	4NP LT 96.0000									
CRYLO LT 4200.0000	ALDRN LT 13.0000									
RDCLM LT 500.0000	ATZ 158.0000									
2H3CL LT 6000.0000	CL6CP LT 54.0000									
2H5CL LT 4000.0000	CLDAN LT 37.0000									
6H6 15100.0000	CPMS 106.0000									
CL3F LT 500.0000	CPMSO LT 15.0000									
CL4 LT 500.0000	CPMSO2 151.0000									
H2CL2 LT 500.0000	DBCP GT 300.0000									
H3BR LT 7000.0000	DCPD LT 5.5000									
H3CL LT 600.0000	DDVP LT 8.5000									
HBR3 LT 5500.0000	DIMP LT 21.0000									
HCL3 3750.0000	DITH LT 3.3000									
LC6H5 38900.0000	DLDRN LT 26.0000									
BRCLM LT 500.0000	DMMP LT 130.0000									
CLB 5140.0000	ENDRN LT 18.0000									
ETC6H5 LT 500.0000	ISODR LT 7.8000									
MEC6H5 550.0000	MLTHN LT 21.0000									
MEK LT 5000.0000	OXAT LT 27.0000									
MIBK LT 700.0000	PCP LT 9.1000									
TCLEA LT 750.0000	PHENOL 19.0000									
TCLEE LT 500.0000	PPDDE LT 14.0000									
TRCLE 2250.0000	PPDDT LT 18.0000									
XYLEN 1140.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-4
Concentrations of Target Analytes
in IRA Ground Water Sampling
at
M-1 Settling Basin
(RMADMS Database)

-------- Field number - WC930001 Site ID - 36193 Site type - WELL Sample Date - 89158 (Julian)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
111TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.1940	N.A.	DIMP 65.0000	N.A.	N.A.	AS 3300.0000		HG 21.0000		CA 180000.000
12TCE LT 1.0000	245TCP LT 2.8000	CPMS 110.0000	CL6CP 4.2000		DMMP 1.5000			AS 3300.0000	F	HG 21.0000	F	CD 135.0000
11DCE LT 1.0000	246TCP LT 3.6000	CPMSO 18.8000	CLDAN LT 0.0950									CR 43.8000
11DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 290.0000	DLDRN LT 0.0500									CU 33.0000
12DCE LT 5.0000	24DMPN LT 4.4000	DITH 85.0000	ENDRN LT 0.0500									K 10600.0000
12DCLE LT 1.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR LT 0.0510									MG 52000.0000
12DCLP LT 1.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540									NA 270000.000
13DCLB LT 1.0000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
13DCP LT 4.8000	2NP LT 8.2000											ZN 65.1000
13DMB LT 1.0000	4CL3C LT 8.5000											
2CLEVE LT 3.5000	4MP LT 2.8000											
ACET LT 8.0000	4NP LT 96.0000											
ACRYLO LT 8.4800	ALDRN LT 13.0000											
BRDCLM LT 1.0000	ATZ LT 5.9000											
C2H3CL LT 12.0000	CL6CP LT 54.0000											
C2H5CL LT 8.0000	CLDAN LT 37.0000											
C6H6 17.1000	CPMS 106.0000											
CCL3F LT 1.0000	CPMSO LT 15.0000											
CCL4 LT 1.0000	CPMSO2 189.0000											
CH2CL2 LT 1.0000	DBCP GT 300.0000											
CH3BR LT 14.0000	DCPD GT 300.0000											
CH3CL LT 1.2000	DDVP LT 8.5000											
CHBR3 LT 11.0000	DIMP LT 21.0000											
CHCL3 91.0000	DITH 7.8200											
CLC6H5 24.0000	DLDRN LT 26.0000											
DBRCLM LT 1.0000	DMMP LT 130.0000											
DCLB 5.2300	ENDRN LT 18.0000											
ETC6H5 LT 1.0000	ISODR LT 7.8000											
MEC6H5 1.7000	MLTHN LT 21.0000											
MEK LT 10.0000	OXAT LT 27.0000											
MIBK 8.8600	PCP LT 9.1000											
TCLEA LT 1.5000	PHENOL LT 2.2000											
TCLEE 1.7600	PPDDE LT 14.0000											
TRCLE LT 1.0000	PPDDT LT 18.0000											
XYLEN LT 2.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-4
Concentrations of Target Analytes
in IRA Ground Water Sampling
at
M-1 Settling Basin
(RMADMS Database)

---------- Field number - WC93G011 Site ID - 36193 Site type - WELL Sample Date - 89166 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	F lag	Mercury	F lag	ICP Metals
111TCE LT 200.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.7980	N.A.	DIMP 80.0000	TDGCL LT 67.0000	N.A.	AS 4000.0000	F	HG 23.0000	F	CA 120000.000
112TCE LT 200.0000	245TCP LT 2.8000	CPMS LT 5.6900	CLDAN 3.2000		DMMP 13.0000			AS 4000.0000		HG 24.0000		CD 113.0000
11DCE LT 200.0000	246TCP LT 3.6000	CPMSO 38.0000	DLDRN 0.0691									CR LT 24.0000
11DCLE LT 200.0000	24DCLP LT 8.4000	CPMSO2 LT 7.4600	ENDRN 0.2160									CU LT 26.0000
12DCE LT 1000.0000	24DMPN LT 4.4000	DITH 1.9600	ISODR 0.2720									K 6530.0000
12DCLE LT 200.0000	24DNP LT 176.0000	DMDS LT 0.5500	PPDDE LT 0.0540									MG 43100.0000
12DCLP LT 200.0000	2CLP LT 2.8000	OXAT 3.5800	PPDDT 0.5010									NA 260000.000
13DCLB LT 200.0000	2MP LT 3.6000											PB LT 74.0000
13DCP LT 960.0000	2NP LT 8.2000											ZN 44.1000
13DMB LT 200.0000	4CL3C LT 8.5000											
2CLEVE LT 700.0000	4MP LT 2.8000											
ACET LT 1600.0000	4NP LT 96.0000											
ACRYLO LT 1680.0000	ALDRN LT 13.0000											
BRDCLM LT 200.0000	ATZ LT 5.9000											
C2H3CL LT 2400.0000	CL6CP LT 54.0000											
C2H5CL LT 1600.0000	CLDAN LT 37.0000											
C6H6 2790.0000	CPMS 118.0000											
CCL3F LT 200.0000	CPMSO LT 15.0000											
CCL4 LT 200.0000	CPMSO2 201.0000											
CH2CL2 384.0000	DBCP GT 300.0000											
CH3BR LT 2800.0000	DCPD GT 300.0000											
CH3CL LT 240.0000	DDVP LT 8.5000											
CHBR3 LT 2200.0000	DIMP 170.0000											
CHCL3 15800.0000	DITH LT 3.3000											
CLC6H5 3650.0000	DLDRN LT 26.0000											
DBRCLM LT 200.0000	DMMP LT 130.0000											
DCLB 879.0000	ENDRN LT 18.0000											
ETC6H5 LT 200.0000	ISODR LT 7.8000											
MEC6H5 260.0000	MLTHN LT 21.0000											
MEK LT 2000.0000	OXAT LT 27.0000											
MIBK 1310.0000	PCP LT 9.1000											
TCLEA LT 300.0000	PHENOL 47.4000											
TCLEE 222.0000	PPDDE LT 14.0000											
TRCLE LT 200.0000	PPDDT LT 18.0000											
XYLEN LT 400.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement -> Site type (WELL - UGL) and (BORE WASS, CMPH - UGG)
GT - greater than ND - Not detected F - Indicates filtered sample analysis

Table 4-7
Concentrations of Target Analytes
In IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC87S011 Site ID - 36187 Site type - BORE Sample Date - 89125 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	N.A.	IMPA LT 2.1100	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000			CR 12.3000
		CPMSO2 LT 9.0100								CU 10.0000
		DITH LT 1.4500								PB 41.1000
		OXAT LT 1.7400								ZN 47.0000

--------- Field number - WC87S041 Site ID - 36187 Site type - BORE Sample Date - 89125 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	N.A.	IMPA LT 2.1100	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000			CR 12.1000
		CPMSO2 LT 9.0100								CU 7.5000
		DITH LT 1.4500								PB 18.2000
		OXAT LT 1.7400								ZN 38.3000

--------- Field number - WC88S011 Site ID - 36188 Site type - BORE Sample Date - 89123 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP 0.0435	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS 28.8000	HG 0.6520	CD 3.2600
		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 20.3000
		CPMSO2 LT 9.0100								CU 55.8000
		DITH LT 1.4500								PB 50.6000
		DMDS LT 3.1200								ZN 85.9000
		OXAT LT 1.7400								

--------- Field number - WC88S041 Site ID - 36188 Site type - BORE Sample Date - 89123 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 18.1000
		CPMSO2 LT 9.0100								CU 10.4000
		DITH LT 1.4500								PB LT 8.4000
		DMDS LT 3.1200								ZN 57.0000
		OXAT LT 1.7400								

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
--------- Field number - WC89S011	Site ID - 36189		Site type - BORE	Sample Date - 89118 (Julian)								
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP 0.2280	N.A.	IMPA LT 2.1100	AS 5.7100		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR 21.2000
		CPMSO2 LT 9.0100										CU 12.5000
		DITH LT 1.4500										PB LT 8.4000
		DMDS LT 3.1200										ZN 65.9000
		OXAT LT 1.7400										
--------- Field number - WC89S041	Site ID - 36189		Site type - BORE	Sample Date - 89118 (Julian)								
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP 0.0650	DIMP 0.7910	N.A.	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA 7.9500					CR LT 6.5000
		CPMSO2 LT 9.0100										CU LT 4.7000
		DITH LT 1.4500										PB LT 8.4000
		DMDS LT 3.1200										ZN 20.8000
		OXAT LT 1.7400										

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

-------- Field number - WC90S011 Site ID - 36190 Site type - BORE Sample Date - 89109 (Julian)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
.T.	ALDRN LT 0.3000	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.2280	N.A.	IMPA LT 2.1100	AS 17.5000		HG GT 1.0000		CD 1.5000
	ATZ LT 0.3000	CPMS LT 4.4000			DMMP LT 0.2660		MPA LT 2.0000					CR 10.3000
	CL6CP LT 0.6000	CPMSO2 LT 9.0100										CU 9.8800
	CLDAN GT 25.1000	DITH LT 1.4500										PB 26.5000
	CPMS LT 0.9000	DMDS LT 3.1200										ZN 41.5000
	CPMSO LT 0.3000	OXAT LT 1.7400										
	CPMSO2 LT 0.3000											
	DBCP LT 0.3000											
	DCPD LT 1.0000											
	DDVP LT 3.0000											
	DIMP LT 1.0000											
	DITH LT 0.4000											
	DLDRN 1.6600											
	ENDRN LT 0.5000											
	ISODR LT 0.3000											
	MLTHN LT 0.7000											
	OXAT LT 0.3000											
	PPDDE LT 0.6000											
	PPDDT LT 0.5000											
	PRTHN LT 0.9000											
	SUPONA LT 0.6000											

-------- Field number - WC90S041 Site ID - 36190 Site type - BORE Sample Date - 89110 (Julian)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
.T.	L.T.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.2280	N.A.	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.2660		MPA LT 2.0000					CR LT 6.5000
		CPMSO2 LT 9.0100										CU LT 4.7000
		DITH LT 1.4500										PB LT 8.4000
		DMDS LT 3.1200										ZN 27.5000
		OXAT LT 1.7400										

Table 4-7
Concentrations of Target Analytes
In IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

-------- Field number - WC915041 Site ID - 36191 Site type - BORE Sample Date - 89129 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	F a g	Mercury	F a g	ICP Metals
.T.	N.A.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000					CR 17.6000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230									CU 9.4400
		DITH LT 1.4500	ENDRN LT 0.0058									PB 19.9000
		DMDS LT 3.1200	ISODR LT 0.0011									ZN 48.5000
		OXAT LT 1.7400	PPDDE LT 0.0024									
			PPDDT LT 0.0020									

-------- Field number - WC915191 Site ID - 36191 Site type - BORE Sample Date - 89129 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	F a g	Mercury	F a g	ICP Metals
.T.	N.A.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD 1.0900
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000					CR 16.6000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230									CU 30.6000
		DITH LT 1.4500	DLDRN LT 0.0033									PB LT 8.4000
		DMDS LT 3.1200	ENDRN LT 0.0058									ZN 93.0000
		OXAT LT 1.7400	ISODR LT 0.0011									
			PPDDE LT 0.0024									
			PPDDT LT 0.0020									

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-------- Field number - WC925041 Site ID - 36192 Site type - BORE Sample Date - 89136 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	F a g	Mercury	F a g	ICP Metals
.T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000					CR 15.1000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230									CU 10.1000
		DITH LT 1.4500	DLDRN LT 0.0033									PB 18.5000
		DMDS LT 3.1200	ENDRN LT 0.0058									ZN 52.4000
		OXAT LT 1.7400	ISODR LT 0.0011									
			PPDDE LT 0.0024									
			PPDDT LT 0.0020									

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADHS Database)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMs	IMPA/MPA	Arsenic	Mercury	ICP Metals
-------- Field number - WC92S191	Site ID - 36192	Site type - BORE	Sample Date - 89137 (Julian)							
.T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000	HG 0.3950	CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR LT 6.5000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230							CU 43.1000
		DITH LT 1.4500	DLDRN LT 0.0033							PB 18.4000
		DMDS LT 3.1200	ENDRN LT 0.0058							ZN 110.0000
		OXAT LT 1.7400	ISODR LT 0.0011							
			PPDDE LT 0.0024							
			PPDDT LT 0.0020							
-------- Field number - WC01S151	Site ID - 36TRENCH01	Site type - BORE	Sample Date - 89142 (Julian)							
..T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 12.8000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230							CU 8.2200
		DITH LT 1.4500	DLDRN LT 0.0033							PB LT 8.4000
		DMDS LT 3.1200	ENDRN LT 0.0058							ZN 41.6000
		OXAT LT 1.7400	ISODR LT 0.0011							
			PPDDE LT 0.0024							
			PPDDT LT 0.0020							
-------- Field number - WC01W001	Site ID - 36TRENCH01	Site type - WASS	Sample Date - 89115 (Julian)							
..T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	N.A.	IMPA LT 2.1100	AS LT 2.5000	HG LT 0.0500	CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000			CR 17.0000
		CPMSO2 LT 9.0100								CU 20.3000
		DITH LT 1.4500								PB 18.5000
		DMDS LT 3.1200								ZN 51.3000
		OXAT LT 1.7400								

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

Field information	Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
Field number - WC025151 Site ID - 36TRENCH02 Site type - BORE Sample Date - 89143 (julian)	L.T.	L.T.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4500 DMDS LT 3.1200 OXAT LT 1.7400	ALDRN LT 0.0019 CL6CP LT 0.0018 CLDAN LT 0.0230 DLDRN LT 0.0033 ENDRN LT 0.0058 ISODR LT 0.0011 PPDDE LT 0.0024 PPDDT LT 0.0020	DBCP LT 0.0050	DIMP LT 0.1140 DMMP LT 0.1330	CLC2A LT 35.5000 TDGCL LT 4.2000	IMPA LT 2.1100 MPA LT 2.0000	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400 CR LT 6.3000 CU 27.3000 PB LT 8.4000 ZN 1700.0000
Field number - WC02W001 Site ID - 36TRENCH02 Site type - WASS Sample Date - 89115 (julian)	L.T.	N.A.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4500 DMDS LT 3.1200 OXAT LT 1.7400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140 DMMP LT 0.1330	N.A.	IMPA LT 2.1100 MPA LT 2.0000	AS LT 2.5000		HG LT 0.0500		CD 3.8500 CR 12.7000 CU 26.3000 PB 27.0000 ZN 73.8000
Field number - WC03W001 Site ID - 36TRENCH03 Site type - WASS Sample Date - 89115 (julian)	L.T.	N.A.	BTZ LT 2.0400 CPMS LT 4.4000 CPMSO2 LT 9.0100 DITH LT 1.4500 DMDS LT 3.1200 OXAT LT 1.7400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140 DMMP LT 0.1330	N.A.	IMPA LT 2.1100 MPA LT 2.0000	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400 CR 16.5000 CU 10.5000 PB LT 8.4000 ZN 49.2000

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
-------- Field number - WC04W001 Site ID - 36TRENCH04 Site type - WASS Sample Date - 89117 (Julian)												
.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP 0.5680	N.A.	IMPA LT 2.1100	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR LT 6.5000
		CPMSO2 LT 9.0100										CU LT 4.7000
		DITH LT 1.4500										PB LT 8.4000
		DMDS LT 3.1200										ZN 24.2000
		OXAT LT 1.7400										
-------- Field number - WC05W001 Site ID - 36TRENCH05 Site type - WASS Sample Date - 89124 (Julian)												
.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	N.A.	IMPA LT 2.1100	AS 4.5700		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR 27.7000
		CPMSO2 LT 9.0100										CU 15.9000
		DITH LT 1.4500										PB 12.2000
		OXAT LT 1.7400										ZN 76.2000
-------- Field number - WC06W001 Site ID - 36TRENCH06 Site type - WASS Sample Date - 89124 (Julian)												
.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP LT 0.1140	N.A.	IMPA LT 2.1100	AS 4.0400		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR 24.4000
		CPMSO2 LT 9.0100										CU 15.3000
		DITH LT 1.4500										PB 11.9000
		OXAT LT 1.7400										ZN 72.9000
-------- Field number - WC07W001 Site ID - 36TRENCH07 Site type - WASS Sample Date - 89123 (Julian)												
.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP 0.0277	DIMP 2.8500	CLC2A LT 35.5000	IMPA LT 2.1100	AS 5.3600		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330	TDCCL LT 4.2000	MPA LT 2.0000					CR 23.1000
		CPMSO2 LT 9.0100										CU 16.5000
		DITH 2.2700										PB LT 8.4000
		DMDS LT 3.1200										ZN 91.3000
		OXAT LT 1.7400										

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WC09N001 Site ID - 36TRENCH09 Site type - WASS Sample Date - 89117 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP 6.7000	DIMP 6.0000	N.A.	IMPA LT 2.1100	AS 46.0000	HG 13.0000	CD 2.1900
		CPMS LT 4.4000			DMMP LT 0.1330		MPA 10.2000			CR 30.3000
		CPMSO2 LT 9.0100								CU 49.2000
		DITH LT 1.4500								PB 1400.0000
		DMDS LT 3.1200								ZN 255.0000
		OXAT LT 1.7400								

---------- Field number - WC10N001 Site ID - 36TRENCH10 Site type - WASS Sample Date - 89121 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
111TCE LT 0.4300	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP 0.4470	CLC2A LT 35.5000	IMPA LT 2.1100	AS 5.5200	HG 0.9070	CD LT 0.7400
112TCE LT 0.3900		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 41.3000
11DCLE LT 1.7000		CPMSO2 LT 9.0100								CU 53.4000
12DCE 6.0000		DITH LT 1.4500								PB 790.0000
12DCLE LT 0.5600		DMDS LT 3.1200								ZN 353.0000
13DNB LT 0.7400		OXAT LT 1.7400								
BCHPD LT 0.3600										
C6H6 LT 0.2500										
CCL4 LT 0.2500										
CH2CL2 LT 1.5000										
CHCL3 LT 0.2900										
CLC6H5 LT 1.5000										
DBCP LT 2.4000										
DCPD LT 0.6400										
DMDS LT 20.0000										
ETC6H5 LT 0.3800										
MEC6H5 LT 0.2500										
MIBK LT 0.7300										
TCLEE LT 0.2500										
TRCLE 5.3000										
XYLEN LT 4.9000										

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC11W001 Site ID - 36TRENCH11 Site type - WASS Sample Date - 89117 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP 0.2280	N.A.	IMPA LT 2.1100	AS 3.4800		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR 11.8000
		CPMSO2 LT 9.0100										CU 15.3000
		DITH LT 1.4500										PB 25.8000
		DMDS LT 3.1200										ZN 49.8000
		OXAT LT 1.7400										

--------- Field number - WC13W001 Site ID - 36TRENCH13 Site type - WASS Sample Date - 89118 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	N.A.	DBCP 0.1700	DIMP 0.2270	N.A.	IMPA LT 2.1100	AS 4.6200		HG 0.1230		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330		MPA LT 2.0000					CR 11.7000
		CPMSO2 LT 9.0100										CU 66.8000
		DITH LT 1.4500										PB 10000.0000
		DMDS LT 3.1200										ZN 71.3000
		OXAT LT 1.7400										

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F A G | Mercury	F A G | ICP metals
--------- Field number - WC14W001	Site ID - 36TRENCH14	Site type - WASS	Sample Date - 89121 (julian)							
111TCE LT 0.4300	N.A.	BTZ LT 2.0400	N.A.	DBCP LT 0.0050	DIMP 0.2180	CLC2A LT 35.5000	IMPA LT 2.1100	AS 28.1000	HG 12.0000	CD 2.1600
112TCE 0.7450		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 81.6000
11DCLE LT 1.7000		CPMSO2 LT 9.0100								CU 80.0000
12DCE 4.9900		DITH LT 1.4500								PB 10000.0000
12DCLE LT 0.5600		DMDS LT 3.1200								ZN 578.0000
13DMB LT 0.7400		OXAT L 1.7400								
3CHPD LT 0.3600										
C6H6 LT 0.2500										
CCL4 LT 0.2500										
CH2CL2 LT 1.5000										
CHCL3 LT 0.2900										
CLC6H5 LT 1.5000										
DBCP LT 2.4000										
DCPD LT 0.6400										
DMDS LT 20.0000										
ETC6H5 LT 0.3800										
MEC6H5 LT 0.2500										
MIBK LT 0.7300										
TCLEE 0.5200										
TRCLE 17.5000										
XYLEN LT 4.9000										
--------- Field number - WC15W001	Site ID - 36TRENCH15	Site type - WASS	Sample Date - 89129 (julian)							
L.T.	L.T.	BTZ LT 2.0400	CL6CP LT 0.0018	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS 2100.0000	HG 69.0000	CD 28.8000
		CPMS LT 4.4000	PPDDE LT 0.0024		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000			CR 15.9000
		CPMSO2 LT 9.0100								CU 17.4000
		DITH LT 1.4500								PB 83.8000
		DMDS LT 3.1200								ZN 94.6000
		OXAT LT 1.7400								

Table 4-7
Concentrations of Target Analytes
in IRA Sampling of Soils and Waste
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC16W001 Site ID - 36TRENCH16 Site type - WASS Sample Date - 89129 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
L.T.	N.A.	BTZ LT 2.0400	ALDRN LT 0.0019	DBCP LT 0.0050	DIMP LT 0.1140	CLC2A LT 35.5000	IMPA LT 2.1100	AS 4100.0000		HG 800.0000		CD 220.0000
		CPMS LT 4.4000	CLDAN LT 0.0230		DMMP LT 0.1330	TDGCL LT 4.2000	MPA LT 2.0000					CR 14.8000
		CPMSO2 LT 9.0100	ENDRN LT 0.0056									CU 18.8000
		DITH LT 1.4500	PPDDE LT 0.0024									PB 31.9000
		DMDS LT 3.1200										ZN 73.9000
		OXAT LT 1.7400										

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement -> Site type (WELL - UGL) and (BORE, WASS, CMPH - UGG)
GT - greater than ND - Not detected F - Indicates filtered sample analysis

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WC670001 Site ID - 36067 Site type - WELL Sample Date - 89117 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F a g Mercury	F a g ICP Metals
111TCE LT 100.0000	236TCP 46.7000	BTZ 230.0000	ALDRN 0.7750	DBCP 2200.0000	DIMP LT 0.3920	TDGCL LT 67.0000	N.A.	AS 17.9000	HG 1.8300	CA 230000.000
112TCE LT 100.0000	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP 1.9000		DMMP 1600.0000					CD LT 8.4000
11DCE LT 100.0000	246TCP LT 3.6000	CPMSO 65.4000	CLDAN LT 0.0950							CR LT 24.0000
11DCLE LT 100.0000	24DCLP LT 8.4000	CPMSO2 11.0000	DLDRN 1.7000							CU 54.4000
12DCE LT 500.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN 1.9000							K 4620.0000
12DCLE LT 100.0000	24DNP LT 176.0000	DMDS 330.0000	ISODR 5.8000							MG 82600.0000
12DCLP LT 100.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE 0.6830							NA 460000.000
13DCLB LT 100.0000	2MP 118.0000		PPDDT 2.2000							PB LT 74.0000
13DCP LT 480.0000	2NP LT 8.2000									ZN 53.5000
13DMB LT 100.0000	4CL3C 76.4000									
2CLEVE LT 350.0000	4MP 106.0000									
ACET LT 800.0000	4NP LT 96.0000									
ACRYLO LT 840.0000	ALDRN LT 13.0000									
BRDCLM LT 100.0000	ATZ LT 5.9000									
C2H3CL LT 1200.0000	CL6CP LT 54.0000									
C2H5CL LT 800.0000	CLDAN LT 37.0000									
C6H6 3020.0000	CPMS LT 10.0000									
CCL3F LT 100.0000	CPMSO LT 15.0000									
CCL4 LT 100.0000	CPMSO2 LT 5.3000									
CH2CL2 2830.0000	DBCP GT 300.0000									
CH3BR LT 1400.0000	DCPD GT 300.0000									
CH3CL LT 120.0000	DDVP LT 8.5000									
CHBR3 LT 1100.0000	DIMP LT 21.0000									
CHCL3 6900.0000	DITH LT 3.3000									
CLC6H5 LT 100.0000	DLDRN LT 26.0000									
DBRCLM LT 100.0000	DMMP 894.0000									
DCLB LT 200.0000	ENDRN LT 18.0000									
ETC6H5 LT 100.0000	ISODR LT 7.8000									
MEC6H5 160.0000	MLTHN LT 21.0000									
MEK LT 1000.0000	OXAT LT 27.0000									
MIBK LT 140.0000	PCP LT 9.1000									
TCLEA LT 150.0000	PHENOL LT 2.2000									
TCLEE LT 100.0000	PPDDE LT 14.0000									
TRCLE LT 100.0000	PPDDT LT 18.0000									
XYLEN LT 200.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

-------- Field number - WC75C001 Site ID - 36075 Site type - WELL Sample Date - 89108 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F lag	Mercury	F lag	ICP Metals
11TCE LT 1.0000	L.T.	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 0.5880	N.A.	FC2A	AS LT 2.3500		HG LT 0.1000		CA 110000.000
127CE LT 1.0000		CPMS LT 5.6900	CL6CP LT 0.0480		DMMP LT 0.1880							CD LT 8.4000
1DCE LT 1.0000		CPMSO 35.8000	CLDAN LT 0.0950									CR LT 24.0000
1DCLE LT 1.0000		CPMSO2 LT 7.4600	DLDRN LT 0.0500									CU LT 26.0000
2DCE LT 5.0000		DITH LT 1.3400	ENDRN LT 0.0500									K 1990.0000
2DCLE LT 1.0000		DMDS LT 0.5500	ISODR LT 0.0510									MG 47200.0000
2DCLP LT 1.0000		OXAT LT 2.3800	PPDDE LT 0.0540									NA 360000.000
3DCLB LT 1.0000			PPDDT LT 0.0490									PB LT 74.0000
3DCP LT 4.8000												ZN LT 22.0000
3DMB LT 1.0000												
CLEVE LT 3.5000												
.CET LT 8.0000												
.CRYLO LT 8.4000												
RDCLM LT 1.0000												
:2H3CL LT 12.0000												
:2H5CL LT 8.0000												
:6H6 LT 1.0000												
'CL3F LT 1.0000												
:CL4 LT 1.0000												
H2CL2 LT 1.0000												
H3BR LT 14.0000												
H3CL LT 1.2000												
HBR3 LT 11.0000												
HCL3 1.8000												
:LC6H5 LT 1.0000												
BRCLM LT 1.0000												
CLB LT 2.0000												
:TC6H5 LT 1.0000												
EC6H5 LT 1.0000												
EK LT 10.0000												
IBK LT 1.4000												
TCLEA LT 1.5000												
TCLEE LT 1.0000												
TRCLE 1.5000												
XYLEN LT 2.0000												

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC75C021 Site ID - 36075 Site type - WELL Sample Date - 89157 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
111TCE LT 1.0000	L.T.	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 0.7640	N.A.	FC2A LT 100.0000	AS 2.4900		HG LT 0.1000		CA 91600.0000
112TCE LT 1.0000		CPMS LT 5.6900	CL6CP LT 0.0480		DMMP LT 0.1880		IMPA LT 100.0000					CD LT 8.4000
11DCE LT 1.0000		CPMSO LT 11.5000	CLDAN LT 0.0950				MPA LT 100.0000					CR LT 24.0000
11DCLE LT 1.0000		CPMSO2 LT 7.4600	DLDRN LT 0.0500									CU LT 26.0000
12DCE LT 5.0000		DITH LT 1.3400	ENDRN LT 0.0500									K 2390.0000
12DCLE LT 1.0000		DMDS LT 0.5500	ISODR LT 0.0510									MG 41500.0000
12DCLP LT 1.0000		OXAT LT 2.3800	PPDDE LT 0.0540									NA 390000.000
13DCLB LT 1.0000			PPDDT LT 0.0490									PB LT 74.0000
13DCP LT 4.8000												ZN LT 22.0000
13DMB LT 1.0000												
2CLEVE LT 3.5000												
ACET LT 8.0000												
ACRYLO LT 8.4000												
BRDCLM LT 1.0000												
C2H3CL LT 12.0000												
C2H5CL LT 8.0000												
C6H6 LT 1.0000												
CCL3F LT 1.0000												
CCL4 LT 1.0000												
CH2CL2 LT 1.0000												
CH3BR LT 14.0000												
CH3CL LT 1.2000												
CHBR3 LT 11.0000												
CHCL3 1.6000												
CLC6H5 LT 1.0000												
DBRCLM LT 1.0000												
DCLB LT 2.0000												
ETC6H5 LT 1.0000												
MEC6H5 LT 1.0000												
MEK LT 10.0000												
MIBK LT 1.4000												
TCLEA LT 1.5000												
TCLEE LT 1.0000												
TRCLE 1.5000												
XYLEN LT 2.0000												

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field Number - WC75C031 Site ID - 36075 Site type - WELL Sample Date - 89166 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F Mercury	F ICP Metals
111TCE LT 1.0000	L.T.	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 0.9250	TDGCL LT 6.6900	FC2A LT 100.0000	AS LT 2.3500	HG LT 0.1000	CA 91400.0000
112TCE LT 1.0000		CPMS LT 5.6900	CLDAN LT 0.0950		DMMP LT 0.1880		IMPA LT 100.0000			CD LT 8.4000
11DCE LT 1.0000		CPMSO LT 11.5000	DLDRN LT 0.0500				MPA LT 500.0000			CR LT 24.0000
11DCLE LT 1.0000		CPMSO2 LT 7.4600	ENDRN LT 0.0500							CU LT 26.0000
12DCE LT 5.0000		DITH LT 1.3400	ISODR LT 0.0510							K 2360.0000
12DCLE LT 1.0000		DMDS LT 0.5500	PPDDE LT 0.0540							MG 40800.0000
12DCLP LT 1.0000		OXAT LT 2.3800	PPDDT LT 0.0490							NA 380000.000
13DCLB LT 1.0000										PB LT 74.0000
13DCP LT 4.8000										ZN LT 22.0000
13DMB LT 1.0000										
2CLEVE LT 3.5000										
ACET LT 8.0000										
ACRYLO LT 8.4000										
BRDCLM LT 1.0000										
C2H3CL LT 12.0000										
C2H5CL LT 8.0000										
C6H6 LT 1.0000										
CCL3F LT 1.0000										
CCL4 LT 1.0000										
CH2CL2 LT 1.0000										
CH3BR LT 14.0000										
CH3CL LT 1.2000										
CHBR3 LT 11.0000										
CHCL3 2.2000										
CLC6H5 LT 1.0000										
DBRCLM LT 1.0000										
DCLB LT 2.0000										
ETC6H5 LT 1.0000										
MEC6H5 LT 1.0000										
MEK LT 10.0000										
MIBK LT 1.4000										
TCLEA LT 1.5000										
TCLEE LT 1.0000										
TRCLE 2.0000										
XYLEN LT 2.0000										

Table 4-8
Concentrations of Target Analytes
In IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC800001 Site ID - 36080 Site type - WELL Sample Date - 89121 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	Mercury	ICP Metals
111TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP 0.3810	DIMP 8600.0000	TDGCL LT 6.6900	FC2A LT 1000.0000	AS 22.7000	HG 0.1280	CA 920000.000
112TCE 1.1200	245TCP LT 2.8000	CPMS LT 5.6900	CLDAN LT 0.0950		DMMP LT 0.1880		IMPA LT 1000.0000			CD LT 8.4000
11DCE LT 1.0000	246TCP LT 3.6000	CPMSO LT 11.5000	DLDRN 3.7000				MPA LT 1000.0000			CR LT 24.0000
11DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 LT 7.4600	ENDRN 17.0000							CU LT 26.0000
12DCE 5.4000	24DMPN LT 4.4000	DITH 7.2600	ISODR 20.0000							K 7040.0000
12DCLE 4.9200	24DNP LT 176.0000	DMDS LT 0.5500	PPDDE 6.4000							MG 310000.000
12DCLP LT 1.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDT 19.0000							NA 2100000.00
13DCLB LT 1.0000	2MP LT 3.6000									PB LT 74.0000
13DCP LT 4.8000	2NP LT 8.2000									ZN 77.5000
13DMB LT 1.0000	4CL3C LT 8.5000									
2CLEVE LT 3.5000	4MP LT 2.8000									
ACET LT 8.0000	4NP LT 96.0000									
ACRYLO LT 8.4000	ALDRN LT 13.0000									
BRDCLM LT 1.0000	ATZ LT 5.9000									
C2H3CL LT 12.0000	CL6CP LT 54.0000									
C2H5CL LT 8.0000	CLDAN LT 37.0000									
C6H6 0.7750	CPMS LT 10.0000									
CCL3F LT 1.0000	CPMSO LT 15.0000									
CCL4 LT 1.0000	CPMSO2 LT 5.3000									
CH2CL2 LT 1.0000	DBCP LT 12.0000									
CH3BR LT 14.0000	DCPD LT 5.5000									
CH3CL LT 1.2000	DDVP LT 8.5000									
CHBR3 LT 11.0000	DIMP GT 200.0000									
CHCL3 5.5000	DITH LT 3.3000									
CLC6H5 LT 1.0000	DLDRN LT 26.0000									
DBRCLM LT 1.0000	DMMP LT 130.0000									
DCLB LT 2.0000	ENDRN LT 18.0000									
ETC6H5 LT 1.0000	ISODR LT 7.8000									
MEC6H5 LT 1.0000	MLTHN LT 21.0000									
MEK LT 10.0000	OXAT LT 27.0000									
MIBK LT 1.4000	PCP LT 9.1000									
TCLEA LT 1.5000	PHENOL LT 2.2000									
TCLEE LT 1.0000	PPDDE LT 14.0000									
TRCLE 20.0000	PPDDT LT 18.0000									
XYLEN LT 2.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WC840001 Site ID - 36084 Site type - WELL Sample Date - 89115 (Julian)

Volatiles		Semi-volatiles		OSCs		OCPs		DBCP		DIMP/DMMP		OSCMS		IMPA/MPA		Arsenic		Flag Mercury		Flag ICP Metals	
111TCE	LT 10.0000	236TCP	LT 1.7000	BTZ	LT 5.0000	ALDRN	LT 0.0500	DBCP	LT 0.1950	DMMP	17.6000	TDGCL	LT 6.6900	N.A.		AS	116.0000	HG	LT 0.1000	CA	980000.000
112TCE	LT 10.0000	245TCP	LT 2.8000	CPMS	LT 5.6900	CL6CP	0.0814													CD	LT 8.4000
11DCE	LT 10.0000	246TCP	LT 3.6000	CPMSO	LT 11.5000	CLDAN	2.9000													CR	LT 24.0000
11DCLE	LT 10.0000	24DCLP	LT 8.4000	CPMSO2	LT 7.4600	DLDRN	0.4970													CU	LT 26.0000
12DCE	LT 50.0000	24DMPN	LT 4.4000	DITH	LT 1.3400	ENDRN	LT 0.0500													K	27000.0000
12DCLE	LT 10.0000	24DNP	LT 176.0000	DMDS	LT 0.5500	ISODR	2.4000													MG	410000.000
12DCLP	LT 10.0000	2CLP	LT 2.8000	OXAT	LT 2.3800	PPDDE	0.3080													NA	3900000.00
13DCLB	LT 10.0000	2MP	LT 3.6000			PPDDT	0.5920													PB	LT 74.0000
13DCP	LT 48.0000	2NP	LT 8.2000																	ZN	102.0000
13DMB	LT 10.0000	4CL3C	LT 8.5000																		
2CLEVE	LT 35.0000	4MP	LT 2.8000																		
ACET	LT 80.0000	4NP	LT 96.0000																		
ACRYLO	LT 84.0000	ALDRN	LT 13.0000																		
BRDCLM	LT 10.0000	ATZ	LT 5.9000																		
C2H3CL	LT 120.0000	CL6CP	LT 54.0000																		
C2H5CL	LT 80.0000	CLDAN	LT 37.0000																		
C6H6	LT 10.0000	CPMS	LT 10.0000																		
CCL3F	LT 10.0000	CPMSO	LT 15.0000																		
CCL4	LT 10.0000	CPMSO2	LT 5.3000																		
CH2CL2	LT 10.0000	DBCP	LT 12.0000																		
CH3BR	LT 140.0000	DCPD	LT 5.5000																		
CH3CL	LT 12.0000	DDVP	LT 8.5000																		
CHBR3	LT 110.0000	DIMP	GT 200.0000																		
CHCL3	24.0000	DITH	GT 100.0000																		
CLC6H5	LT 10.0000	DLDRN	LT 26.0000																		
DBRCLM	LT 10.0000	DMMP	LT 130.0000																		
DCLB	LT 20.0000	ENDRN	LT 18.0000																		
ETC6H5	LT 10.0000	ISODR	LT 7.8000																		
MEC6H5	LT 10.0000	MLTHN	LT 21.0000																		
MEK	LT 100.0000	OXAT	56.8000																		
MIBK	LT 14.0000	PCP	LT 9.1000																		
TCLEA	LT 15.0000	PHENOL	LT 2.2000																		
TCLEE	LT 10.0000	PPDDE	LT 14.0000																		
TRCLE	690.0000	PPDDT	LT 18.0000																		
XYLEN	LT 20.0000	PRTHN	LT 37.0000																		
		SUPONA	LT 19.0000																		

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WC85C001 Site ID - 36085 Site type - WELL Sample Date - 89122 (julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
N.A.	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP 0.4090	DIMP 170.0000	TDGCL LT 67.0000	N.A.	AS 51.3000		HG 0.2400		CA 950000.000
	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP LT 0.0480		DMMP 7.8400							CD LT 8.4000
	246TCP LT 3.6000	CPMSO 22.2000	CLDAN LT 0.0950									CR LT 24.0000
	24DCLP LT 8.4000	CPMSO2 15.2000	DLDRN 0.7870									CU LT 26.0000
	24DMPN LT 4.4000	DITH 150.0000	ENDRN 0.3180									K 35000.0000
	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.1620									MG 300000.000
	2CLP LT 2.8000	OXAT 250.0000	PPDDE 0.1650									NA 1100000.00
	2MP LT 3.6000		PPDDT 0.4700									PB LT 74.0000
	2NP LT 8.2000											ZN 33.1000
	4CL3C LT 8.5000											
	4MP LT 2.8000											
	4NP LT 96.0000											
	ALDRN LT 13.0000											
	ATZ LT 5.9000											
	CL6CP LT 54.0000											
	CLDAN LT 37.0000											
	CPMS LT 10.0000											
	CPMSO LT 15.0000											
	CPMSO2 18.9000											
	DBCP LT 12.0000											
	DCPD LT 5.5000											
	DDVP LT 8.5000											
	DIMP GT 200.0000											
	DITH LT 3.3000											
	DLDRN LT 26.0000											
	DMMP LT 130.0000											
	ENDRN LT 18.0000											
	ISODR LT 7.8000											
	MLTHN LT 21.0000											
	OXAT LT 27.0000											
	PCP LT 9.1000											
	PHENOL LT 2.2000											
	PPDDE LT 14.0000											
	PPDDT LT 18.0000											
	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WCB70001 Site ID - 36087 Site type - WELL Sample Date - 89117 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag / Mercury	Flag / ICP Metals
111TCE LT 200.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP 48.0000	DIMP 2.8100	TDGCL LT 6.6900	N.A.	AS 10.8000	HG 0.3730	CA 110000.000
112TCE LT 200.0000	245TCP LT 2.8000	CPMS LT 5.5900	CL6CP 3.3000		DIMP LT 0.3920					CD LT 8.4000
11DCE LT 200.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950		DMMP 10.8000					CR LT 24.0000
11DCLE LT 200.0000	24DCLP LT 8.4000	CPMSO2 1[illegible].6000	DLDRN 0.0929		DMMP 2200.0000					CU LT 26.0000
12DCE LT 1000.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN LT 0.0500							K 3240.0000
12DCLE LT 200.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.2160							MG 27200.0000
12DCLP LT 200.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540							NA 130000.000
13DCLB LT 200.0000	2MP LT 3.6000		PPDDT LT 0.0490							PB LT 74.0000
13DCP LT 960.0000	2NP LT 8.2000									ZN 38.3000
13DMB LT 200.0000	4CL3C LT 8.5000									
2CLEVE LT 700.0000	4MP LT 2.8000									
ACET 20600.0000	4NP LT 96.0000									
ACRYLO LT 1680.0000	ALDRN LT 13.0000									
BRDCLM LT 200.0000	ATZ LT 5.9000									
C2H3CL LT 2400.0000	CL6CP LT 54.0000									
C2H5CL LT 1600.0000	CLDAN LT 37.0000									
C6H6 LT 200.0000	CPMS LT 10.0000									
CCL3F LT 200.0000	CPMSO LT 15.0000									
CCL4 1140.0000	CPMSO2 11.7000									
CH2CL2 LT 200.0000	DBCP 131.0000									
CH3BR LT 2800.0000	DCPD LT 5.5000									
CH3CL LT 240.0000	DDVP LT 8.5000									
CHBR3 LT 2200.0000	DIMP LT 21.0000									
CHCL3 8800.0000	DITH LT 3.3000									
CLC6H5 462.0000	DLDRN LT 26.0000									
DBRCLM LT 200.0000	DMMP LT 130.0000									
DCLB 617.0000	ENDRN LT 18.0000									
ETC6H5 LT 200.0000	ISODR LT 7.8000									
MEC6H5 LT 200.0000	MLTHN LT 21.0000									
MEK LT 2000.0000	OXAT LT 27.0000									
MIBK 1210.0000	PCP LT 9.1000									
TCLEA LT 300.0000	PHENOL LT 2.2000									
TCLEE LT 200.0000	PPDDE LT 14.0000									
TRCLE LT 200.0000	PPDDT LT 18.0000									
XYLEN LT 400.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

-------- Field number - WC88G001 Site ID - 36088 Site type - WELL Sample Date - 89118 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
11TCE LT 10.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 95.0000	TDGCL LT 67.0000	N.A.	AS 93.3000		HG 0.2360		CA 900000.000
12TCE LT 10.0000	245TCP LT 2.8000	CPMS 13.1000	CL6CP 0.1530		DMMP 30.0000							CD LT 8.4000
1DCE LT 10.0000	246TCP LT 3.6000	CPMSO 41.8000	CLDAN LT 0.0950									CR 47.0000
1DCLE LT 10.0000	24DCLP LT 8.4000	CPMSO2 12.7000	DLDRN 0.3910									CU LT 26.0000
2DCE LT 50.0000	24DMPN LT 4.4000	DITH 1400.0000	ENDRN 0.0984									K 13000.0000
2DCLE 79.3000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.8330									MG 300000.000
2DCLP LT 10.0000	2CLP LT 2.8000	OXAT 91.0000	PPDDE 0.3390									NA 230000.000
3DCLB LT 10.0000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
3DCP LT 48.0000	2NP LT 8.2000											ZN 196.0000
3DMB LT 10.0000	4CL3C LT 8.5000											
'CLEVE LT 35.0000	4MP LT 2.8000											
.CET 938.0000	4NP LT 96.0000											
.CRYLO LT 84.0000	ALDRN LT 13.0000											
RDCLM LT 10.0000	ATZ LT 5.9000											
2H3CL LT 120.0000	CL6CP LT 54.0000											
2H5CL LT 80.0000	CLDAN LT 37.0000											
6H6 LT 10.0000	CPMS LT 10.0000											
CL3F LT 10.0000	CPMSO LT 15.0000											
CL4 LT 10.0000	CPMSO2 LT 5.3000											
H2CL2 LT 10.0000	DBCP LT 12.0000											
H3BR LT 140.0000	DCPD LT 5.5000											
H3CL LT 12.0000	DDVP LT 8.5000											
HBR3 LT 110.0000	DIMP 84.0000											
HCL3 LT 10.0000	DITH GT 100.0000											
LC6H5 LT 10.0000	DLDRN LT 26.0000											
BRCLM LT 10.0000	DMMP LT 130.0000											
CLB LT 20.0000	ENDRN LT 18.0000											
TC6H5 LT 10.0000	ISODR LT 7.8000											
EC6H5 LT 10.0000	MLTHN LT 21.0000											
EK LT 100.0000	OXAT 59.0000											
IBK 167.0000	PCP LT 9.1000											
TCLEA LT 15.0000	PHENOL LT 2.2000											
TCLEE LT 10.0000	PPDDE LT 14.0000											
RCLE LT 10.0000	PPDDT LT 18.0000											
YLEN LT 20.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field Number - WC80G001 Site ID - 36180 Site type - WELL Sample Date - 89118 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F I & Q Mercury	F I & Q ICP Metals
111TCE LT 10.0000	236TCP LT 1.7000	BTZ 51.4000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 7800.0000	TDGCL LT 67.0000	N.A.	AS 85.4000	HG 0.1770	CA 670000.000
112TCE LT 10.0000	245TCP LT 2.8000	CPMS 7.0300	CL6CP 0.0956		DMMP LT 0.1880					CD LT 8.4000
11DCE LT 10.0000	246TCP LT 3.6000	CPMSO 22.2000	CLDAN 120.0000							CR LT 24.0000
11DCLE LT 10.0000	24DCLP LT 8.4000	CPMSO2 15.3000	DLDRN 2.1000							CU LT 26.0000
12DCE LT 50.0000	24DMPN LT 4.4000	DITH 2600.0000	ENDRN 0.5000							K 5230.0000
12DCLE 131.0000	24DNP LT 176.0000	DMDS 1.6900	ISODR 0.9390							MG 320000.000
12DCLP LT 10.0000	2CLP LT 2.8000	OXAT 280.0000	PPDDE 0.6700							NA 2300000.00
13DCLB LT 10.0000	2MP LT 3.6000		PPDDT LT 0.0490							PB LT 74.0000
13DCP LT 40.0000	2NP LT 6.2000									ZN 59.2000
13DMB LT 10.0000	4CL3C LT 8.5000									
2CLEVE LT 35.0000	4MP LT 2.8000									
ACET LT 80.0000	4NP LT 96.0000									
ACRYLO LT 84.0000	ALDRN LT 13.0000									
BRDCLM LT 10.0000	ATZ LT 5.9000									
C2H3CL LT 120.0000	CL6CP LT 54.0000									
C2H5CL LT 80.0000	CLDAN LT 37.0000									
C6H6 LT 10.0000	CPMS LT 10.0000									
CCL3F LT 10.0000	CPMSO LT 15.0000									
CCL4 LT 10.0000	CPMSO2 LT 5.3000									
CH2CL2 LT 10.0000	DBCP LT 12.0000									
CH3BR LT 140.0000	DCPD LT 5.5000									
CH3CL LT 12.0000	DDVP LT 8.5000									
CHBR3 LT 110.0000	DIMP GT 200.0000									
CHCL3 LT 10.0000	DITH GT 100.0000									
CLC6H5 LT 10.0000	DLDRN LT 26.0000									
DBRCLM LT 10.0000	DMMP LT 130.0000									
DCLB LT 20.0000	ENDRN LT 18.0000									
ETC6H5 LT 10.0000	ISODR LT 7.8000									
MEC6H5 LT 10.0000	MLTHN LT 21.0000									
MEK LT 100.0000	OXAT 207.0000									
MIBK LT 14.0000	PCP LT 9.1000									
TCLEA LT 15.0000	PHENOL LT 2.2000									
TCLEE LT 10.0000	PPDDE LT 14.0000									
TRCLE 270.0000	PPDDT LT 18.0000									
XYLEN LT 20.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field Number - WC870001 Site ID - 36187 Site type - WELL Sample Date - 89159 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	Mercury	ICP Metals
11TCE LT 1.0000 L.T.		BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP 20.0000	TDGCL LT 6.6900	FC2A LT 500.0000	AS 49.0000	HG 0.1260	CA 670000.000
12TCE LT 1.0000		CPMS LT 5.6900	CL6CP LT 0.0480		DMMP LT 0.1880		IMPA LT 500.0000			CD LT 8.4000
1DCE LT 1.0000		CPMSO LT 11.5000	CLDAN LT 0.0950				MPA LT 500.0000			CR LT 24.0000
1DCLE LT 1.0000		CPMSO2 27.6000	DLDRN 0.0496							CU LT 26.0000
2DCE LT 5.0000		DITH 290.0000	ENDRN LT 0.0500							K 7710.0000
2DCLE 50.3000		DMDS LT 0.5500	ISODR 0.0764							MG 140000.000
2DCLP LT 1.0000		OXAT 26.0000	PPDDE LT 0.0540							NA 900000.000
3DCLB LT 1.0000			PPDDT LT 0.0490							PB LT 74.0000
3DCP LT 4.8000										ZN 34.3000
3DMB LT 1.0000										
CLEVE LT 3.5000										
CET LT 8.0000										
CRYLO LT 8.4000										
RDCLM LT 1.0000										
2H3CL LT 12.0000										
2H5CL LT 8.0000										
6H6 LT 1.0000										
CL3F LT 1.0000										
CL4 LT 1.0000										
H2CL2 LT 1.0000										
H3BR LT 14.0000										
H3CL LT 1.2000										
HBR3 LT 11.0000										
HCL3 8.3000										
LC6H5 LT 1.0000										
BRCLM LT 1.0000										
CLB LT 2.0000										
TC6H5 LT 1.0000										
EC6H5 LT 1.0000										
EK LT 10.0000										
IBK LT 1.4000										
TCLEA LT 1.5000										
TCLEE LT 1.0000										
RCLE LT 1.0000										
YLEN LT 2.0000										

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADHS Database)

-------- Field number - WC86G001 Site ID - 36188 Site type - WELL Sample Date - 89156 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	F & G	Mercury	F & G	ICP Metals
11TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 9.5000	DBCP LT 0.1950	DIMP 30000.0000	TDGCL LT 6.6900	FC2A LT 500.0000	AS 80.3000		HG 0.2290		CA 1000000.00
12TCE LT 1.0000	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP LT 0.0480		DMMP LT 0.1880		IMPA LT 500.0000					CD LT 8.4000
1DCE LT 1.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950				MPA LT 500.0000					CR LT 24.0000
1DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 140.0000	DLDRN 0.7000									CU LT 26.0000
2DCE LT 5.0000	24DMPN LT 4.4000	DITH 810.0000	ENDRN LT 0.5000									K 11000.0000
2DCLE 16.1000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.9210									MG 410000.000
2DCLP LT 1.0000	2CLP LT 2.8000	OXAT 100.0000	PPDDE LT 0.0540									NA 3600000.00
3DCLB LT 1.0000	2MP LT 3.6000		PPDDT LT 0.4900									PB LT 74.0000
3DCP LT 4.8000	2NP LT 8.2000											ZN LT 22.0000
3DNB LT 1.0000	4CL3C LT 8.5000											
CLEVE LT 3.5000	4MP LT 2.8000											
CET LT 8.0000	4NP LT 96.0000											
CRYLO LT 8.4000	ALDRN LT 13.0000											
RDCLM LT 1.0000	ATZ LT 5.9000											
2H3CL LT 12.0000	CL6CP LT 54.0000											
2H5CL LT 8.0000	CLDAN LT 37.0000											
6H6 LT 1.0000	CPMS LT 10.0000											
CL3F LT 1.0000	CPMSO LT 15.0000											
CL4 LT 1.0000	CPMSO2 LT 5.3000											
H2CL2 LT 1.0000	DBCP LT 12.0000											
H3BR LT 14.0000	DCPD LT 5.5000											
H3CL LT 1.2000	DDVP LT 8.5000											
HBR3 LT 11.0000	DIMP GT 200.0000											
HCL3 LT 1.0000	DITH LT 3.3000											
LC6H5 LT 1.0000	DLDRN LT 26.0000											
BRCLM LT 1.0000	DMMP LT 130.0000											
CLB LT 2.0000	ENDRN LT 18.0000											
TC6H5 LT 1.0000	ISODR LT 7.8000											
EC6H5 LT 1.0000	MLTHN LT 21.0000											
EK LT 10.0000	OXAT 64.4000											
IBK LT 1.4000	PCP LT 9.1000											
CLEA LT 1.5000	PHENOL LT 2.2000											
CLEE 6.6700	PPDDE LT 14.0000											
RCLE 2.4000	PPDDT LT 18.0000											
YLEN LT 2.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-8
Concentrations of Target Analytes
In IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC89C001 Site ID - 36189 Site type - WELL Sample Date - 89158 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F & G	Mercury	F & G	ICP Metals
11TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 8.0000	DBCP LT 0.1950	DIMP 6900.0000	N.A.	FC2A LT 500.0000	AS 74.4000		HG 0.1210		CA 860000.000
12TCE 3.7400	245TCP LT 2.0000	CPMS LT 5.6900	CL6CP 0.0828		DMMP LT 190.0000		IMPA LT 500.0000					CD LT 8.4000
1DCE LT 1.0000	246TCP LT 3.6000	CPMSO 18.2000	CLDAN LT 0.0950				MPA LT 500.0000					CR LT 24.0000
1DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 26.9000	DLDRN 0.1050									CU LT 26.0000
2DCE 8.7600	24DMPN LT 4.4000	DITH 2200.0000	ENDRN 0.0893									K 5430.0000
2DCLE 21.1000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.2270									MG 330000.000
2DCLP LT 1.0000	2CLP LT 2.8000	OXAT 240.0000	PPDDE LT 0.0540									NA 1800000.00
3DCLB LT 1.0000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
3DCP LT 4.8000	2NP LT 8.2000											ZN LT 22.0000
3DMB LT 1.0000	4CL3C LT 8.5000											
'CLEVE LT 3.5000	4MP LT 2.8000											
.CET LT 8.0000	4NP LT 96.0000											
.CRYLO LT 8.4000	ALDRN LT 13.0000											
RDCLM LT 1.0000	ATZ LT 5.9000											
2H3CL LT 12.0000	CL6CP LT 54.0000											
2H5CL LT 8.0000	CLDAN LT 37.0000											
6H6 LT 1.0000	CPMS LT 10.0000											
CL3F LT 1.0000	CPMSO LT 15.0000											
CL4 LT 1.0000	CPMSO2 LT 5.3000											
H2CL2 LT 1.0000	DBCP LT 12.0000											
H3BR LT 14.0000	DCPD LT 5.5000											
H3CL LT 1.2000	DDVP LT 8.5000											
HBR3 LT 11.0000	DIMP GT 200.0000											
HCL3 2.5000	DITH GT 100.0000											
LC6H5 LT 1.0000	DLDRN LT 26.0000											
BRCLM LT 1.0000	DMMP LT 130.0000											
CLB LT 2.0000	ENDRN LT 18.0000											
TC6H5 LT 1.0000	ISODR LT 7.8000											
EC6H5 LT 1.0000	MLTHN LT 21.0000											
EK LT 10.0000	OXAT 131.0000											
IBK LT 1.4000	PCP LT 9.1000											
TCLEA LT 1.5000	PHENOL LT 2.2000											
TCLEE LT 1.0000	PPDDE LT 14.0000											
TRCLE 100.0000	PPDDT LT 18.0000											
XYLEN LT 2.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADHS Database)

-------- Field number - WC90G001 Site ID - 36190 Site type - WELL Sample Date - 89157 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	F & Q Mercury	F & Q ICP Metals
11TCE LT 1.0000	236TCP LT 1.7000	BTZ 30.6000	ALDRN 0.8840	DBCP 1200.0000	DIMP 1300.0000	N.A.	N.A.	AS 16.7000	HG LT 0.1000	CA 540000.000
12TCE LT 1.0000	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP 3.0000		DMMP 2100.0000					CD LT 8.4000
1DCE LT 1.0000	246TCP LT 3.6000	CPMSO 22.9000	CLDAN LT 0.0950							CR LT 24.0000
1DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 13.4000	DLDRN LT 0.0500							CU LT 36.0000
2DCE LT 5.0000	24DMPN LT 4.4000	DITH 22.7000	ENDRN LT 0.0500							K 7300.0000
2DCLE LT 1.0000	24DNP LT 176.0000	DMDS 8.9400	ISODR LT 0.0510							MG 250000.000
2DCLP 3.0000	2CLP LT 2.8000	OXAT 7.6600	PPDDE GT 10.0000							NA 1300000.00
3DCLB LT 1.0000	2MP LT 3.6000		PPDDT 1.0000							PB LT 74.0000
3DCP LT 4.8000	2NP LT 8.2000									ZN 27.4000
3DMB LT 1.0000	4CL3C LT 8.5000									
CLEVE LT 3.5000	4MP LT 2.8000									
CET LT 8.0000	4NP LT 96.0000									
CRYLO LT 8.4000	ALDRN LT 13.0000									
RDCLM LT 1.0000	ATZ LT 5.9000									
2H3CL LT 12.0000	CL6CP LT 54.0000									
2H5CL LT 8.0000	CLDAN LT 37.0000									
6H6 9.3000	CPMS LT 10.0000									
CL3F LT 1.0000	CPMSO LT 15.0000									
CL4 LT 1.0000	CPMSO2 26.4000									
H2CL2 LT 1.0000	DBCP GT 300.0000									
H3BR LT 14.0000	DCPD 56.7000									
H3CL LT 1.2000	DDVP LT 8.5000									
HBR3 LT 11.0000	DIMP GT 200.0000									
HCL3 71.0000	DITH 11.8000									
LC6H5 LT 1.0000	DLDRN LT 26.0000									
BRCLM LT 1.0000	DMMP LT 130.0000									
CLB LT 2.0000	ENDRN LT 18.0000									
TC6H5 LT 1.0000	ISODR LT 7.8000									
EC6H5 LT 1.0000	MLTHN LT 21.0000									
EK LT 10.0000	OXAT LT 27.0000									
IBK LT 1.4000	PCP LT 9.1000									
CLEA LT 1.5000	PHENOL LT 2.2000									
CLEE 1.4800	PPDDE LT 14.0000									
RCLE LT 1.0000	PPDDT LT 18.0000									
YLEN LT 2.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC90C011 Site ID - 36190 Site type - WELL Sample Date - 89166 (Julian)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F&G Mercury	F&G ICP Metals
111TCE LT 200.0000	236TCP LT 1.7000	BTZ 16.2000	ALDRN 2.1000	DBCP 530.0000	DIMP 1200.0000	TDGCL LT 67.0000	FC2A LT 1000.0000	AS 56.4000	HG LT 0.1000	CA 400000.000
112TCE LT 200.0000	245TCP LT 2.8000	CPMS LT 5.6900	CLDAN 21.0000		DMMP 1300.0000		IMPA LT 1000.0000			CD LT 8.4000
11DCE LT 200.0000	246TCP LT 3.6000	CPMSO 30.1000	DLDRN LT 0.0500				MPA LT 1000.0000			CR 52.5000
1DCLE LT 200.0000	24DCLP LT 8.4000	CPMSO2 44.2000	ENDRN 2.5000							CU LT 26.0000
2DCE LT 1000.0000	24DMPN LT 4.4000	DITH 9.6500	ISODR 3.2000							K 14000.0000
2DCLE LT 200.0000	24DNP LT 176.0000	DMDS 710.0000	PPDDE 1.6000							MG 180000.000
2DCLP LT 200.0000	2CLP LT 2.8000	OXAT 6.0000	PPDDT 3.7000							NA 970000.000
3DCLB LT 200.0000	2MP LT 3.6000									PB LT 74.0000
3DCP LT 960.0000	2NP LT 8.2000									ZN 122.0000
3DNB LT 200.0000	4CL3C LT 8.5000									
CLEVE LT 700.0000	4MP LT 2.8000									
CET 5930.0000	4NP LT 96.0000									
CRYLO LT 1680.0000	ALDRN LT 13.0000									
RDCLM LT 200.0000	ATZ LT 5.9000									
2H3CL LT 2400.0000	CL6CP LT 54.0000									
2H5CL LT 1600.0000	CLDAN LT 37.0000									
6H6 LT 200.0000	CPMS LT 10.0000									
CL3F LT 200.0000	CPMSO LT 15.0000									
CL4 LT 200.0000	CPMSO2 39.0000									
H2CL2 525.0000	DBCP GT 300.0000									
H3BR LT 2800.0000	DCPD 44.1000									
H3CL LT 240.0000	DDVP LT 8.5000									
HBR3 LT 2200.0000	DIMP GT 200.0000									
HCL3 2600.0000	DITH LT 3.3000									
LC6H5 LT 200.0000	DLDRN LT 26.0000									
BRCLM LT 200.0000	DMMP LT 130.0000									
CLB LT 400.0000	ENDRN LT 18.0000									
TC6H5 LT 200.0000	ISODR LT 7.8000									
EC6H5 LT 200.0000	MLTHN LT 21.0000									
EK LT 2000.0000	OXAT LT 27.0000									
IBK LT 280.0000	PCP LT 9.1000									
CLEA LT 300.0000	PHENOL LT 2.2000									
CLEE LT 200.0000	PPDDE LT 14.0000									
RCLE LT 200.0000	PPDDT LT 18.0000									
YLEN LT 400.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC92C001 Site ID - 36192 Site type - WELL Sample Date - 89164 (Julian)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
..T.	L.T.	BTZ LT 5.0000	ALDRN LT 0.0500	DBCP LT 0.1950	DIMP LT 0.3920	TDGCL LT 6.6900	FC2A LT 100.0000	AS LT 2.3500		HG LT 0.1000		CA 230000.000
		CPMS LT 5.6900	CL6CP LT 0.0480		DMMP LT 0.1880		IMPA LT 100.0000					CD LT 6.4000
		CPMSO LT 11.5000	CLDAN LT 0.0950				MPA LT 100.0000					CR LT 24.0000
		CPMSO2 LT 7.4600	DLDRN LT 0.0500									CU LT 26.0000
		DITH LT 1.3400	ENDRN LT 0.0500									K 5060.0000
		DMDS LT 0.5500	ISODR LT 0.0510									MG 21900.0000
		OXAT LT 2.3800	PPDDE LT 0.0540									NA 750000.000
			PPDDT LT 0.0490									PB LT 74.0000
												ZN 424.0000

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC900001 Site ID - 36590 Site type - WELL Sample Date - 89116 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	Mercury	ICP Metals
11TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.1730	DBCP 84.0000	DIMP 1.0900	TDGCL LT 6.6900	N.A.	AS LT 2.3500	HG 0.1770	CA 140000.000
12TCE LT 1.0000	245TCP LT 2.8000	CPMS 170.0000	CL6CP 0.8700		DMMP 1100.0000					CD LT 6.4000
1DCE LT 1.0000	246TCP LT 3.6000	CPMSO 36.4000	CLDAN LT 0.0950							CR LT 24.0000
1DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 32.8000	DLDRN 0.1930							CU LT 26.0000
2DCE LT 5.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN 0.1880							K 2610.0000
2DCLE LT 1.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.0808							MG 39400.0000
2DCLP 56.8000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE 0.0742							NA 320000.000
3DCLB LT 1.0000	2MP LT 3.6000		PPDDT 0.1480							PB LT 74.0000
3DCP LT 4.8000	2NP LT 8.2000									ZN LT 22.0000
3DMB LT 1.0000	4CL3C LT 8.5000									
CLEVE LT 3.5000	4MP LT 2.8000									
CET LT 8.0000	4NP LT 96.0000									
CRYLO LT 8.4000	ALDRN LT 13.0000									
RDCLM LT 1.0000	ATZ LT 5.9000									
2H3CL LT 12.0000	CL6CP LT 54.0000									
2H5CL LT 8.0000	CLDAN LT 37.0000									
6H6 1.9400	CPMS 164.0000									
CL3F LT 1.0000	CPMSO 70.2000									
CL4 89.9000	CPMSO2 60.4000									
H2CL2 LT 1.0000	DBCP 85.6000									
H3BR LT 14.0000	DCPD LT 5.5000									
H3CL LT 1.2000	DDVP LT 8.5000									
HBR3 LT 11.0000	DIMP LT 21.0000									
HCL3 32.0000	DITH LT 3.3000									
LC6H5 LT 1.0000	DLDRN LT 26.0000									
BRCLM LT 1.0000	DMMP LT 130.0000									
CLB LT 2.0000	ENDRN LT 18.0000									
TC6H5 LT 1.0000	ISODR LT 7.8000									
EC6H5 LT 1.0000	MLTHN LT 21.0000									
EK LT 10.0000	OXAT LT 27.0000									
IBK LT 1.4000	PCP LT 9.1000									
TCLEA LT 1.5000	PHENOL LT 2.2000									
TCLEE LT 1.0000	PPDDE LT 14.0000									
TRCLE 40.0000	PPDDT LT 18.0000									
XYLEN 4.9500	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

--------- Field number - WC910001 Site ID - 36591 Site type - WELL Sample Date - 89116 (Julian)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
11TCE LT 1.0000	236TCP GT 100.0000	BTZ LT 5.0000	ALDRN 0.9550	DBCP 570.0000	DIMP LT 0.3920	TDGCL LT 6.6900	N.A.	AS LT 2.3500	HG 0.1180	CA 180000.000
12TCE LT 1.0000	245TCP 33.0000	CPMS LT 5.6900	CL6CP 3.1000		DMMP 750.0000					CD LT 8.4000
1DCE LT 1.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN 59.0000							CR LT 24.0000
1DCLE LT 1.0000	24DCLP 9.5100	CPMSO2 14.2000	DLDRN 4.5000							CU LT 26.0000
2DCE LT 5.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN 0.7100							K 4400.0000
2DCLE LT 1.0000	24DNP LT 176.0000	DMDS 18.6000	ISODR 0.4540							MG 38400.0000
2DCLP LT 1.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE 0.6490							NA 180000.000
3DCLB LT 1.0000	2NP LT 3.6000		PPDDT 0.7650							PB LT 74.0000
3DCP LT 4.8000	3NP LT 8.2000									ZN LT 22.0000
3DMB LT 1.0000	4CL3C LT 8.5000									
CLEVE LT 3.5000	4MP LT 2.8000									
CET LT 8.0000	4NP LT 96.0000									
CRYLO LT 8.4000	ALDRN LT 13.0000									
BRDCLM LT 1.0000	ATZ LT 5.9000									
C2H3CL LT 12.0000	CL6CP LT 54.0000									
C2H5CL LT 8.0000	CLDAN LT 37.0000									
C6H6 LT 1.0000	CPMS 264.0000									
CCL3F LT 1.0000	CPMSO 146.0000									
CCL4 27.5000	CPMSO2 201.0000									
CH2CL2 LT 1.0000	DBCP 119.0000									
CH3BR LT 14.0000	DCPD LT 5.5000									
CH3CL LT 1.2000	DDVP LT 8.5000									
CHBR3 LT 11.0000	DIMP LT 21.0000									
CHCL3 43.0000	DITH LT 3.3000									
CLC6H5 LT 1.0000	DLDRN LT 26.0000									
DBRCLM LT 1.0000	DMMP LT 130.0000									
DCLB 20.6000	ENDRN LT 18.0000									
ETC6H5 LT 1.0000	ISODR LT 7.8000									
MEC6H5 5.9000	MLTHN LT 21.0000									
MEK LT 10.0000	OXAT LT 27.0000									
MIBK LT 1.4000	PCP LT 9.1000									
TCLEA LT 1.5000	PHENOL 32.4000									
TCLEE LT 1.0000	PPDDE LT 14.0000									
TRCLE LT 1.0000	PPDDT LT 18.0000									
XYLEN LT 2.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

Table 4-8
Concentrations of Target Analytes
In IRA Sampling of Ground Water
at
Complex Disposal Trench
(RMADMS Database)

---------- Field number - WC930001 Site ID - 36593 Site type - WELL Sample Date - 89115 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F a g Mercury	F a g ICP Metals
111TCE LT 10.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.0639	DBCP 14.0000	DMMP 11.9000	TDGCL LT 6.6900	N.A.	AS 3.4500	HG 0.1480	CA 68200.0000
112TCE LT 10.0000	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP 0.2520							CD LT 8.4000
11DCE LT 10.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950							CR LT 24.0000
11DCLE LT 10.0000	24DCLP LT 8.4000	CPMSO2 LT 7.4600	DLDRN 0.2300							CU LT 26.0000
12DCE LT 50.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN LT 0.0500							K 2190.0000
12DCLE LT 10.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR LT 0.0510							MG 30400.0000
12DCLP LT 10.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540							NA 350000.000
13DCLB LT 10.0000	2MP LT 3.6000		PPDDT LT 0.0490							PB LT 74.0000
13DCP LT 48.0000	2NP LT 8.2000									ZN 27.8000
13DMB LT 10.0000	4CL3C LT 8.5000									
2CLEVE LT 35.0000	4MP LT 2.8000									
ACET LT 80.0000	4NP LT 96.0000									
ACRYLO LT 84.0000	ALDRN LT 13.0000									
BRDCLM LT 10.0000	ATZ LT 5.9000									
C2H3CL LT 120.0000	CL6CP LT 54.0000									
C2H5CL LT 80.0000	CLDAN LT 37.0000									
C6H6 171.0000	CPMS 22.6000									
CCL3F LT 10.0000	CPMSO 263.0000									
CCL4 165.0000	CPMSO2 9.1800									
CH2CL2 LT 10.0000	DBCP LT 12.0000									
CH3BR LT 140.0000	DCPD LT 5.5000									
CH3CL LT 12.0000	DDVP LT 8.5000									
CHBR3 LT 110.0000	DIMP LT 21.0000									
CHCL3 570.0000	DITH LT 3.3000									
CLC6H5 33.7000	DLDRN LT 26.0000									
DBRCLM LT 10.0000	DMMP LT 130.0000									
DCLB LT 20.0000	ENDRN LT 18.0000									
ETC6H5 LT 10.0000	ISODR LT 7.8000									
MEC6H5 LT 10.0000	MLTHN LT 21.0000									
MEK LT 100.0000	OXAT LT 27.0000									
MIBK LT 14.0000	PCP LT 9.1000									
TCLEA LT 15.0000	PHENOL LT 2.2000									
TCLEE LT 10.0000	PPDDE LT 14.0000									
TRCLE 86.0000	PPDDT LT 18.0000									
XYLEN LT 20.0000	PRTHN LT 37.0000									
	SUPONA LT 19.0000									

L.T. - less then (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement -> Site type (WELL - UGL) and (BORE, WASS, CMPH - UGG)
GT - greater then ND - Not detected F - Indicates filtered sample analysis

Tables 4-11 and 4-1[illegible]

Table 4-11
Concentrations of Target Analytes
in IRA Sampling of Soils
at
Lime Settling Basins
(RMADMS Database)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
-------- Field number - WC93S001	Site ID - 36193	Site type - BORE	Sample Date - 89136 (Julian)									
.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 7.6900		HG 0.1660		N.A.
-------- Field number - WC93S041	Site ID - 36193	Site type - BORE	Sample Date - 89136 (Julian)									
.T.	L.T.	BTZ LT 2.0400	ALDRN LT 0.0019	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS LT 2.5000		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000	CL6CP LT 0.0018		DMMP LT 0.1330	TDGCL LT 4.2000						CR 10.3000
		CPMSO2 LT 9.0100	CLDAN LT 0.0230									CU 8.2600
		DITH LT 1.4500	DLDRN LT 0.0033									PB 11.6000
		DMDS LT 3.1200	ENDRN LT 0.0058									ZN 40.5000
		OXAT LT 1.7400	ISODR LT 0.0011									
			PPDDE LT 0.0024									
			PPDDT LT 0.0020									
-------- Field number - WC93S121	Site ID - 36193	Site type - BORE	Sample Date - 89136 (Julian)									
.A.	L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS 13.0000		HG LT 0.0500		N.A.

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Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
-------- Field number - WC94S001	Site ID - 36194	Site type - BORE	Sample Date - 89166 (Julian)									
.T.	L.T.	BTZ LT 2.0400	N.A.	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 3.1700		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000						CR 18.7000
		CPMSO LT 4.8100										CU 26.2000
		CPMSO2 LT 9.0100										PB LT 8.4000
		DITH LT 1.4500										ZN 75.2000
		DMDS LT 3.1200										
		OXAT LT 1.7400										
-------- Field number - WC94S041	Site ID - 36194	Site type - BORE	Sample Date - 89166 (Julian)									
.T.	L.T.	BTZ LT 2.0400	N.A.	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 3.0900		HG LT 0.0500		CD LT 0.7400
		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000						CR 23.7000
		CPMSO LT 4.8100										CU 14.6000
		CPMSO2 LT 9.0100										PB 16.4000
		DITH LT 1.4500										ZN 63.2000
		DMDS LT 3.1200										
		OXAT LT 1.7400										

Table 4-11
Concentrations of Target Analytes
In IRA Sampling of Soils
at
Lime Settling Basins
(RMADMS Database)

-------- Field number - WC945121 Site ID - 36194 Site type - BORE Sample Date - 89166 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
.T.	L.T.	BTZ LT 2.0400	N.A.	N.A.	DIMP LT 0.1140	CLC2A LT 35.5000	N.A.	AS 32.1000		HG LT 0.0500		CD 1.9700
		CPMS LT 4.4000			DMMP LT 0.1330	TDGCL LT 4.2000						CR 20.2000
		CPMSO LT 4.8100										CU 11.5000
		CPMSO2 LT 9.0100										PB LT 8.4000
		DITH LT 1.4500										ZN 52.8000
		DMDS LT 3.1200										
		OXAT LT 1.7400										

L.T. - less then (value)
GT - greater then

N.A. - Not Analyzed
ND - Not detected

R - Rejected-out of control
F - Indicates filtered sample analysis

Units of measurement -> Site type (WELL - UGL) and (BORE, WASS, CMPH - UGG)

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

---------- Field number - WCD1C001   Site ID - 36001   Site type - WELL   Sample Date - 89158 (Julian)

Volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCNs	IMPA/MPA	Arsenic	F&Q	Mercury	F&Q	ICP Metals
111TCE LT 500.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.2350	N.A.	DIMP LT 0.3920	TDGCL LT 6.6900	N.A.	AS LT 2.3500		HG 1.4900	F	CA 150000.000
112TCE LT 500.0000	245TCP LT 2.8000	CPMS GT 50.0000	CL6CP 0.8990					AS LT 2.3500		HG 1.7200		CD LT 8.4000
11DCE LT 500.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950					AS 19.1000		HG 1.9000		CR 55.9000
11DCLE LT 500.0000	24DCLP LT 8.4000	CPMSO2 GT 100.0000	DLDRN LT 0.5000					AS 2.6400	F	HG 2.5000	F	CU 34.1000
12DCE LT 2500.0000	24DMPN LT 4.4000	DITH LT 1.3400	ENDRN 3.2000									K 18000.0000
12DCLE 2310.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR 0.3130									MG 46000.0000
12DCLP LT 500.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540									NA 290000.000
13DCLB LT 500.0000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
13DCP LT 2400.0000	2NP LT 8.2000											ZN 285.0000
13DMB LT 500.0000	4CL3C LT 6.5000											
2CLEVE LT 1750.0000	4MP LT 2.0000											
ACET LT 4000.0000	4NP LT 96.0000											
ACRYLO LT 4200.0000	ALDRN LT 13.0000											
BRDCLM LT 500.0000	ATZ 158.0000											
C2H3CL LT 6000.0000	CL6CP LT 54.0000											
C2H5CL LT 4000.0000	CLDAN LT 37.0000											
C6H6 15100.0000	CPMS 106.0000											
CCL3F LT 500.0000	CPMSO LT 15.0000											
CCL4 LT 500.0000	CPMSO2 151.0000											
CH2CL2 LT 500.0000	DBCP GT 300.0000											
CH3BR LT 7000.0000	DCPD LT 5.5000											
CH3CL LT 600.0000	DDVP LT 8.5000											
CHBR3 LT 5500.0000	DIMP LT 21.0000											
CHCL3 3750.0000	DITH LT 3.3000											
CLC6H5 38900.0000	DLDRN LT 26.0000											
DBRCLM LT 500.0000	DMMP LT 130.0000											
DCLB 5140.0000	ENDRN LT 18.0000											
ETC6H5 LT 500.0000	ISODR LT 7.8000											
MEC6H5 550.0000	MLTHN LT 21.0000											
MEK LT 5000.0000	OXAT LT 27.0000											
MIBK LT 700.0000	PCP LT 9.1000											
TCLEA LT 750.0000	PHENOL 19.0000											
TCLEE LT 500.0000	PPDDE LT 14.0000											
TRCLE 2250.0000	PPDDT LT 18.0000											
XYLEN 1140.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
In IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

------- Field number - WC540001 Site ID - 36054 Site type - WELL Sample Date - 89164 (julian)

olatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
2TCE LT 500.0000	L.T.	BTZ 23.2000	ALDRN 11.0000	N.A.	DIMP LT 0.3920	TDGCL LT 67.0000	N.A.	AS 49.0000	F	HG 5.5000	F	CA 280000.000
DCE LT 500.0000		CPMS 1100.0000	CLDAN 14.0000		DMMP 1200.0000			AS 110.0000		HG 7.0000		CD LT 8.4000
DCLE LT 500.0000		CPMSO 33.2000	DLDRN 1.5000									CR 49.4000
DCE LT 2500.0000		CPMSO2 970.0000	ENDRN 0.6900									CU LT 26.0000
DCLE LT 500.0000		DITH 1.8300	ISODR 1.4000									K 5750.0000
DCLP LT 500.0000		DMDS LT 0.5500	PPDDE 0.3250									MG 78300.0000
DCLB LT 500.0000		OXAT 2.5600	PPDDT 1.7000									NA 518000.000
DCP LT 2400.0000												PB LT 74.0000
DMB LT 500.0000												ZN 31.5000
LEVE LT 1750.0000												
ET LT 4000.0000												
RYLO LT 4200.0000												
DCLM LT 500.0000												
H3CL LT 6000.0000												
H5CL LT 4000.0000												
H6 2870.0000												
L3F LT 500.0000												
L4 LT 500.0000												
2CL2 1260.0000												
CBR LT 7000.0000												
CCL LT 600.0000												
BR3 LT 5500.0000												
CL3 47000.0000												
C6H5 LT 500.0000												
RCLM LT 500.0000												
LB LT 1000.0000												
TC6H5 LT 500.0000												
EC6H5 LT 500.0000												
EK LT 5000.0000												
CLEA LT 750.0000												
CLEE LT 500.0000												
RCLE LT 500.0000												
YLEN LT 1000.0000												

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

-------- Field number - WCS50001 Site ID - 36055 Site type - WELL Sample Date - 89164 (Julian)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCNS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
12TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.3590	N.A.	DIMP 1.9900	TDGCL LT 6.6900	N.A.	AS 42.3000		HG LT 0.1000	F	CA 810000.000
1DCE LT 1.0000	245TCP LT 2.8000	CPMS LT 5.6900	CL6CP LT 0.0480		DMMP 3.4900			AS 39.4000	F	HG LT 0.1000		CD LT 8.4000
1DCLE LT 1.0000	246TCP LT 3.6000	CPMSO LT 11.5000	CLDAN LT 0.0950									CR LT 24.0000
2DCE LT 5.0000	24DCLP LT 8.4000	CPMSO2 65.6000	DLDRN 0.0547									CU LT 26.0000
2DCLE LT 1.0000	24DMPN LT 4.4000	DITH 88.0000	ENDRN 0.0554									K 5530.0000
2DCLP LT 1.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR LT 0.0510									MG 150000.000
3DCLB LT 1.0000	2CLP LT 2.8000	OXAT 120.0000	PPDDE LT 0.0540									NA 2200000.00
3DCP LT 4.8000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
3DMB LT 1.0000	2NP LT 8.2000											ZN 35.5000
CLEVE LT 3.5000	4CL3C LT 8.5000											
CET LT 8.0000	4MP LT 2.8000											
CRYLO LT 8.4000	4NP LT 96.0000											
RDCLM LT 1.0000	ALDRN LT 13.0000											
2H3CL LT 12.0000	ATZ LT 5.9000											
2H5CL LT 8.0000	CL6CP LT 54.0000											
6H6 37.2000	CLDAN LT 37.0000											
CL3F LT 1.0000	CPMS LT 10.0000											
CL4 LT 1.0000	CPMSO LT 15.0000											
H2CL2 LT 1.0000	CPMSO2 365.0000											
H3BR LT 14.0000	DBCP LT 12.0000											
H3CL LT 1.2000	DCPD 25.2000											
HBR3 LT 11.0000	DDVP LT 8.5000											
HCL3 37.0000	DIMP LT 21.0000											
LC6H5 83.7000	DITH 79.1000											
BRCLM LT 1.0000	DLDRN LT 26.0000											
CLB 17.8000	DMMP LT 130.0000											
TC6H5 LT 1.0000	ENDRN LT 18.0000											
4EC6H5 LT 1.0000	ISODR LT 7.8000											
4EK LT 10.0000	MLTHN LT 21.0000											
TCLEA LT 1.5000	OXAT 120.0000											
TCLEE 2.9600	PCP LT 9.1000											
TRCLE 2.2000	PHENOL 237.0000											
XYLEN 4.4600	PPDDE LT 14.0000											
	PPDDT LT 18.0000											
	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

---------- Field number - WC58C001 Site ID - 36058 Site type - WELL Sample Date - 89163 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
111TCE LT10000.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 20.0000	N.A.	DIMP 2700.0000	TDGCL LT 6.6900	N.A.	AS 59.3000		HG 11.0000	F	CA 1900000.00
112TCE LT10000.0000	245TCP LT 2.8000	CPMS 1500.0000	CL6CP 48.0000		DMMP 2500.0000			AS 64.0000		HG 11.0000		CD LT 8.4000
11DCE LT10000.0000	246TCP LT 3.6000	CPMSO 61.0000	CLDAN 24.0000									CR LT 24.0000
11DCLE LT10000.0000	24DCLP LT 8.4000	CPMSO2 830.0000	DLDRN 2.5000									CU LT 26.0000
12DCE LT50000.0000	24DMPN LT 4.4000	DITH 8.4500	ENDRN 1.9000									K 10000.0000
12DCLE LT10000.0000	24DNP LT 176.0000	DMDS 52.0000	ISODR 2.8000									MG 450000.000
12DCLP LT10000.0000	2CLP LT 2.8000	OXAT 6.3000	PPDDE 0.6010									NA 1100000.00
13DCLB LT10000.0000	2MP LT 3.6000		PPDDT 3.3000									PB LT 74.0000
13DCP LT48000.0000	2NP LT 8.2000											ZN 49.4000
13DMB LT10000.0000	4CL3C LT 8.5000											
2CLEVE LT39000.0000	4MP LT 2.8000											
ACET LT80000.0000	4NP LT 96.0000											
ACRYLO LT84000.0000	ALDRN LT 13.0000											
BRDCLM LT10000.0000	ATZ LT 5.9000											
C2H3CL LT120000.000	CL6CP LT 54.0000											
C2H5CL LT80000.0000	CLDAN LT 37.0000											
C6H6 72100.0000	CPMS GT 300.0000											
CCL3F LT10000.0000	CPMSO 26.3000											
CCL4 LT10000.0000	CPMSO2 GT 300.0000											
CH2CL2 LT10000.0000	DBCP 21.4000											
CH3BR LT140000.000	DCPD 20.2000											
CH3CL LT12000.0000	DDVP LT 8.5000											
CHBR3 LT110000.000	DIMP LT 21.0000											
CHCL3 1000000.00	DITH LT 3.3000											
CLC6H5 LT10000.0000	DLDRN LT 26.0000											
DBRCLM LT10000.0000	DMMP 1010.0000											
DCLB LT20000.0000	ENDRN LT 18.0000											
ETC6H5 LT10000.0000	ISODR LT 7.8000											
MEC6H5 31000.0000	MLTHN LT 21.0000											
MEK LT100000.000	OXAT LT 27.0000											
MIBK LT14000.0000	PCP LT 9.1000											
TCLEA LT15000.0000	PHENOL 97.3000											
TCLEE LT10000.0000	PPDDE LT 14.0000											
TRCLE LT10000.0000	PPDDT LT 18.0000											
XYLEN LT20000.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

-------- Field Number - WC76C001 Site ID - 36076 Site type - WELL Sample Date - 89165 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
11TCE LT 500.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.6100	N.A.	DIMP 2.0500	TDGCL LT 67.0000	N.A.	AS 210.0000	F	HG 0.3080	F	CA 330000.000
12TCE LT 500.0000	245TCP LT 2.8000	CPMS 17.7000	CLDAN 6.6000		DMMP 0.8830			AS 210.0000		HG 0.1420		CD LT 8.4000
1DCE LT 500.0000	246TCP LT 3.6000	CPMSO LT 11.5000	DLDRN 0.5500									CR 195.0000
1DCLE LT 500.0000	24DCLP 8.9300	CPMSO2 1600.0000	ENDRN 0.9300									CU 293.0000
2DCE LT 2500.0000	24DMPN LT 4.4000	DITH 28.0000	ISODR 0.8750									K 52000.0000
2DCLE LT 500.0000	24DNP LT 176.0000	DMDS 7.1500	PPDDE 0.3230									MG 80900.0000
2DCLP LT 500.0000	2CLP LT 2.8000	OXAT 36.0000	PPDDT 2.0000									NA 630000.000
3DCLB LT 500.0000	2MP LT 3.6000											PB LT 74.0000
3DCP LT 2400.0000	2NP LT 8.2000											ZN 907.0000
3DMB LT 500.0000	4CL3C LT 8.5000											
CLEVE LT 1750.0000	4MP LT 2.8000											
CET LT 4000.0000	4NP LT 96.0000											
CRYLO LT 4200.0000	ALDRN LT 13.0000											
RDCLM LT 500.0000	ATZ LT 5.9000											
2H3CL LT 6000.0000	CL6CP LT 54.0000											
2H5CL LT 4000.0000	CLDAN LT 37.0000											
6H6 1430.0000	CPMS 18.9000											
CL3F LT 500.0000	CPMSO LT 15.0000											
CL4 LT 500.0000	CPMSO2 GT 300.0000											
H2CL2 3840.0000	DBCP LT 12.0000											
H3BR LT 7000.0000	DCPD LT 5.5000											
H3CL LT 600.0000	DDVP LT 8.5000											
HBR3 LT 5500.0000	DIMP LT 21.0000											
HCL3 20500.0000	DITH 35.5000											
LC6H5 10100.0000	DLDRN LT 26.0000											
BRCLM LT 500.0000	DMMP LT 130.0000											
XCL8 4210.0000	ENDRN LT 18.0000											
TC6H5 LT 500.0000	ISODR LT 7.8000											
4EC6H5 LT 500.0000	MLTHN LT 21.0000											
4EK LT 5000.0000	OXAT 34.9000											
4IBK LT 700.0000	PCP 23.1000											
TCLEA LT 750.0000	PHENOL 67.3000											
TCLEE LT 500.0000	PPDDE LT 14.0000											
TRCLE LT 500.0000	PPDDT LT 18.0000											
XYLEN LT 1000.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

---------- Field number - WC670001 Site ID - 36167 Site type - WELL Sample Date - 89165 (julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCHS	IMPA/MPA	Arsenic	Flag	Mercury	Flag	ICP Metals
111TCE LT 1000.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 6.4000	N.A.	DIMP 56.0000	TDGCL LT 67.0000	N.A.	AS 14000.0000	F	HG LT 0.1000	F	CA 470000.000
112TCE LT 1000.0000	245TCP LT 2.8000	CPMS 270.0000	CLDAN 19.0000		DMMP 1.3100			AS 13000.0000		HG 0.1610		CD 414.0000
11DCE LT 1000.0000	246TCP LT 3.6000	CPMSO 600.0000	DLDRN 9.9000									CR LT 24.0000
11DCLE LT 1000.0000	24DCLP 25.2000	CPMSO2 1800.0000	ENDRN 5.6000									CU LT 26.0000
12DCE LT 5000.0000	24DMPN LT 4.4000	DITH 36.0000	ISODR 2.2000									K 9800.0000
12DCLE LT 1000.0000	24DNP LT 176.0000	DMDS 42.0000	PPDDE 0.8470									MG 24200.0000
12DCLP LT 1000.0000	2CLP LT 2.8000	OXAT 26.0000	PPDDT 3.2000									NA 1100000.00
13DCLB LT 1000.0000	2MP LT 3.6000											PB LT 74.0000
13DCP LT 4800.0000	2NP LT 8.2000											ZN LT 22.0000
13DMB LT 1000.0000	4CL3C LT 8.5000											
2CLEVE LT 3500.0000	4MP 5.9200											
ACET LT 8000.0000	4NP LT 96.0000											
ACRYLO LT 8400.0000	ALDRN LT 13.0000											
BRDCLM LT 1000.0000	ATZ LT 5.9000											
C2H3CL LT12000.0000	CL6CP LT 54.0000											
C2H5CL LT 8000.0000	CLDAN LT 37.0000											
C6H6 7750.0000	CPMS 314.0000											
CCL3F LT 1000.0000	CPMSO 46.8000											
CCL4 LT 1000.0000	CPMSO2 GT 300.0000											
CH2CL2 LT 1000.0000	DBCP LT 12.0000											
CH3BR LT14000.0000	DCPD GT 300.0000											
CH3CL LT 1200.0000	DDVP LT 8.5000											
CHBR3 LT11000.0000	DIMP LT 21.0000											
CHCL3 120000.000	DITH GT 100.0000											
CLC6H5 1830.0000	DLDRN LT 26.0000											
DBRCLM LT 1000.0000	DMMP LT 130.0000											
DCLB LT 2.0000	ENDRN LT 18.0000											
ETC6H5 LT 1000.0000	ISODR LT 7.8000											
MEC6H5 LT 1000.0000	MLTHN LT 21.0000											
MEK LT10000.0000	OXAT LT 27.0000											
MIBK LT 1400.0000	PCP LT 9.1000											
TCLEA LT 1500.0000	PHENOL 127.0000											
TCLEE LT 1000.0000	PPDDE LT 14.0000											
TRCLE LT 1000.0000	PPDDT LT 18.0000											
XYLEN LT 2000.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

---------- Field number - WC93C001 Site ID - 36193 Site type - WELL Sample Date - 89158 (Julian)

Volatiles	Semi-Volatiles	OSCs	OCPs	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F a 0	Mercury	F a 0	ICP Metals
111TCE LT 1.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.1940	N.A.	DIMP 65.0000	N.A.	N.A.	AS 3300.0000		HG 21.0000		CA 180000.000
112TCE LT 1.0000	245TCP LT 2.8000	CPMS 110.0000	CL6CP 4.2000		DMMP 1.5000			AS 3300.0000	F	HG 21.0000	F	CD 135.0000
11DCE LT 1.0000	246TCP LT 3.6000	CPMSO 18.8000	CLDAN LT 0.0950									CR 43.8000
11DCLE LT 1.0000	24DCLP LT 8.4000	CPMSO2 290.0000	DLDRN LT 0.0500									CU 33.0000
12DCE LT 5.0000	24DMPN LT 4.4000	DITH 85.0000	ENDRN LT 0.0500									K 10600.0000
12DCLE LT 1.0000	24DNP LT 176.0000	DMDS LT 0.5500	ISODR LT 0.0510									MG 53000.0000
12DCLP LT 1.0000	2CLP LT 2.8000	OXAT LT 2.3800	PPDDE LT 0.0540									NA 270000.000
13DCLB LT 1.0000	2MP LT 3.6000		PPDDT LT 0.0490									PB LT 74.0000
13DCP LT 4.8000	2NP LT 8.2000											ZN 65.1000
13DMB LT 1.0000	4CL3C LT 8.5000											
2CLEVE LT 3.5000	4MP LT 2.8000											
ACET LT 8.0000	4NP LT 96.0000											
ACRYLO LT 8.4000	ALDRN LT 13.0000											
BRDCLM LT 1.0000	ATZ LT 5.9000											
C2H3CL LT 12.0000	CL6CP LT 54.0000											
C2H5CL LT 8.0000	CLDAN LT 37.0000											
C6H6 17.1000	CPMS 106.0000											
CCL3F LT 1.0000	CPMSO LT 15.0000											
CCL4 LT 1.0000	CPMSO2 189.0000											
CH2CL2 LT 1.0000	DBCP GT 300.0000											
CH3BR LT 14.0000	DCPD GT 300.0000											
CH3CL LT 1.2000	DDVP LT 8.5000											
CHBR3 LT 11.0000	DIMP LT 21.0000											
CHCL3 91.0000	DITH 7.8200											
CLC6H5 24.0000	DLDRN LT 26.0000											
DBRCLM LT 1.0000	DMMP LT 130.0000											
DCLB 5.2300	ENDRN LT 18.0000											
ETC6H5 LT 1.0000	ISODR LT 7.8000											
MEC6H5 1.7000	MLTHN LT 21.0000											
MEK LT 10.0000	OXAT LT 27.0000											
MIBK 8.8600	PCP LT 9.1000											
TCLEA LT 1.5000	PHENOL LT 2.2000											
TCLEE 1.7600	PPDDE LT 14.0000											
TRCLE LT 1.0000	PPDDT LT 18.0000											
XYLEN LT 2.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADMS Database)

--------- Field number - WC93C011 Site ID - 36193 Site type - WELL Sample Date - 89166 (Julian)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DMMP	OSCMS	IMPA/MPA	Arsenic	F l a g	Mercury	F l a g	ICP Metals
111TCE LT 200.0000	236TCP LT 1.7000	BTZ LT 5.0000	ALDRN 0.7980	N.A.	DIMP 80.0000	TDGCL LT 67.0000	N.A.	AS 4000.0000	F	HG 23.0000	F	CA 120000.000
112TCE LT 200.0000	245TCP LT 2.8000	CPMS LT 5.6900	CLDAN 3.2000		DMMP 13.0000			AS 4000.0000		HG 24.0000		CD 113.0000
11DCE LT 200.0000	246TCP LT 3.6000	CPMSO 38.0000	DLDRN 0.0691									CR LT 24.0000
11DCLE LT 200.0000	24DCLP LT 8.4000	CPMSO2 LT 7.4600	ENDRN 0.2160									CU LT 26.0000
12DCE LT 1000.0000	24DMPN LT 4.4000	DITH 1.9600	ISODR 0.2720									K 6530.0000
12DCLE LT 200.0000	24DNP LT 176.0000	DMDS LT 0.5500	PPDDE LT 0.0540									MG 43100.0000
12DCLP LT 200.0000	2CLP LT 2.8000	OXAT 3.5800	PPDDT 0.5010									NA 260000.000
13DCLB LT 200.0000	2MP LT 3.6000											PB LT 74.0000
13DCP LT 960.0000	2NP LT 8.2000											ZN 44.1000
13DMB LT 200.0000	4CL3C LT 8.5000											
2CLEVE LT 700.0000	4MP LT 2.8000											
ACET LT 1600.0000	4NP LT 96.0000											
ACRYLO LT 1600.0000	ALDRN LT 13.0000											
BRDCLM LT 200.0000	ATZ LT 5.9000											
C2H3CL LT 2400.0000	CL6CP LT 54.0000											
C2H5CL LT 1600.0000	CLDAN LT 37.0000											
C6H6 2790.0000	CPMS 118.0000											
CCL3F LT 200.0000	CPMSO LT 15.0000											
CCL4 LT 200.0000	CPMSO2 201.0000											
CH2CL2 384.0000	DBCP GT 300.0000											
CH3BR LT 2800.0000	DCPD GT 300.0000											
CH3CL LT 240.0000	DDVP LT 8.5000											
CHBR3 LT 2200.0000	DIMP 170.0000											
CHCL3 15800.0000	DITH LT 3.3000											
CLC6H5 3650.0000	DLDRN LT 26.0000											
DBRCLM LT 200.0000	DMMP LT 130.0000											
DCLB 879.0000	ENDRN LT 18.0000											
ETC6H5 LT 200.0000	ISODR LT 7.8000											
MEC6H5 260.0000	MLTHN LT 21.0000											
MEK LT 2000.0000	OXAT LT 27.0000											
MIBK 1310.0000	PCP LT 9.1000											
TCLEA LT 300.0000	PHENOL 47.4000											
TCLEE 222.0000	PPDDE LT 14.0000											
TRCLE LT 200.0000	PPDDT LT 18.0000											
XYLEN LT 400.0000	PRTHN LT 37.0000											
	SUPONA LT 19.0000											

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Table 4-12
Concentrations of Target Analytes
in IRA Sampling of Ground Water
at
Lime Settling Basins
(RMADHS Database)

---------- Field number - WC940001 Site ID - 36194 Site type - WELL Sample Date - 89194 (Julian)

Volatiles		Semi-volatiles		OSCs		OCPs		DBCP	DIMP/DMMP		OSCNs		IMPA/MPA	Arsenic		F	Mercury		F	ICP Metals	
111TCE	LT 5000.0000	236TCP	LT 1.7000	CPMSO2	760.0000	ALDRN	11.0000	N.A.	DIMP	LT 0.3920	TDGCL	LT 6.6900	N.A.	AS	6100.0000		HG	0.5890		CA	340000.000
112TCE	LT 5000.0000	245TCP	LT 2.8000	DITH	6.7600	CL6CP	LT 0.0480							AS	5300.0000	F	HG	1.0400	F	CD	243.0000
11DCE	LT 5000.0000	246TCP	LT 3.6000	DMDS	50.0000	CLDAN	2.2000													CR	LT 24.0000
11DCLE	LT 5000.0000	24DCLP	LT 8.4000	OXAT	LT 2.3800	DLDRN	8.3000													CU	LT 26.0000
12DCE	LT25000.0000	24DMPN	LT 4.4000			ENDRN	1.3000													K	5060.0000
12DCLE	LT 5000.0000	24DNP	LT 176.0000			ISODR	2.2000													MG	53400.0000
12DCLP	LT 5000.0000	2CLP	LT 2.8000			PPDDE	LT 0.0540													NA	1400000.00
13DCLB	LT 5000.0000	2MP	LT 3.6000			PPDDT	2.2000													PB	LT 74.0000
13DCP	LT24000.0000	2NP	LT 8.2000																	ZN	29.4000
13DMB	LT 5000.0000	4CL3C	LT 8.5000																		
2CLEVE	LT17500.0000	4MP	LT 2.8000																		
ACET	235000.000	4NP	181.0000																		
ACRYLO	LT42000.0000	ALDRN	LT 13.0000																		
BRDCLM	LT 5000.0000	ATZ	LT 5.9000																		
C2H3CL	LT60000.0000	CL6CP	LT 54.0000																		
C2H5CL	LT40000.0000	CLDAN	LT 37.0000																		
C6H6	37600.0000	CPMS	302.0000																		
CCL3F	LT 5000.0000	CPMSO	263.0000																		
CCL4	LT 5000.0000	CPMSO2	GT 300.0000																		
CH2CL2	20700.0000	DBCP	LT 12.0000																		
CH3BR	LT70000.0000	DCPD	31.5000																		
CH3CL	LT 6000.0000	DDVP	LT 8.5000																		
CHBR3	LT55000.0000	DIMP	LT 21.0000																		
CHCL3	215000.000	DITH	LT 3.3000																		
CLC6H5	8170.0000	DLDRN	LT 26.0000																		
DBRCLM	LT 5000.0000	DMMP	LT 130.0000																		
DCLB	LT10000.0000	ENDRN	LT 18.0000																		
ETC6H5	LT 5000.0000	ISODR	LT 7.8000																		
MEC6H5	LT 5000.0000	MLTHN	LT 21.0000																		
MEK	LT50000.0000	OXAT	LT 27.0000																		
MIBK	LT 7000.0000	PCP	LT 9.1000																		
TCLEA	LT 7500.0000	PHENOL	54.9000																		
TCLEE	LT 5000.0000	PPDDE	LT 14.0000																		
TRCLE	LT 5000.0000	PPDDT	LT 18.0000																		
XYLEN	LT10000.0000	PRTHN	LT 37.0000																		
		SUPONA	LT 19.0000																		

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement -> Site type (WELL - UGL) and (BORE, WASS, CMPH - UGG)
GT - greater than ND - Not detected F - Indicates filtered sample analysis

END